Library

Successful Methods

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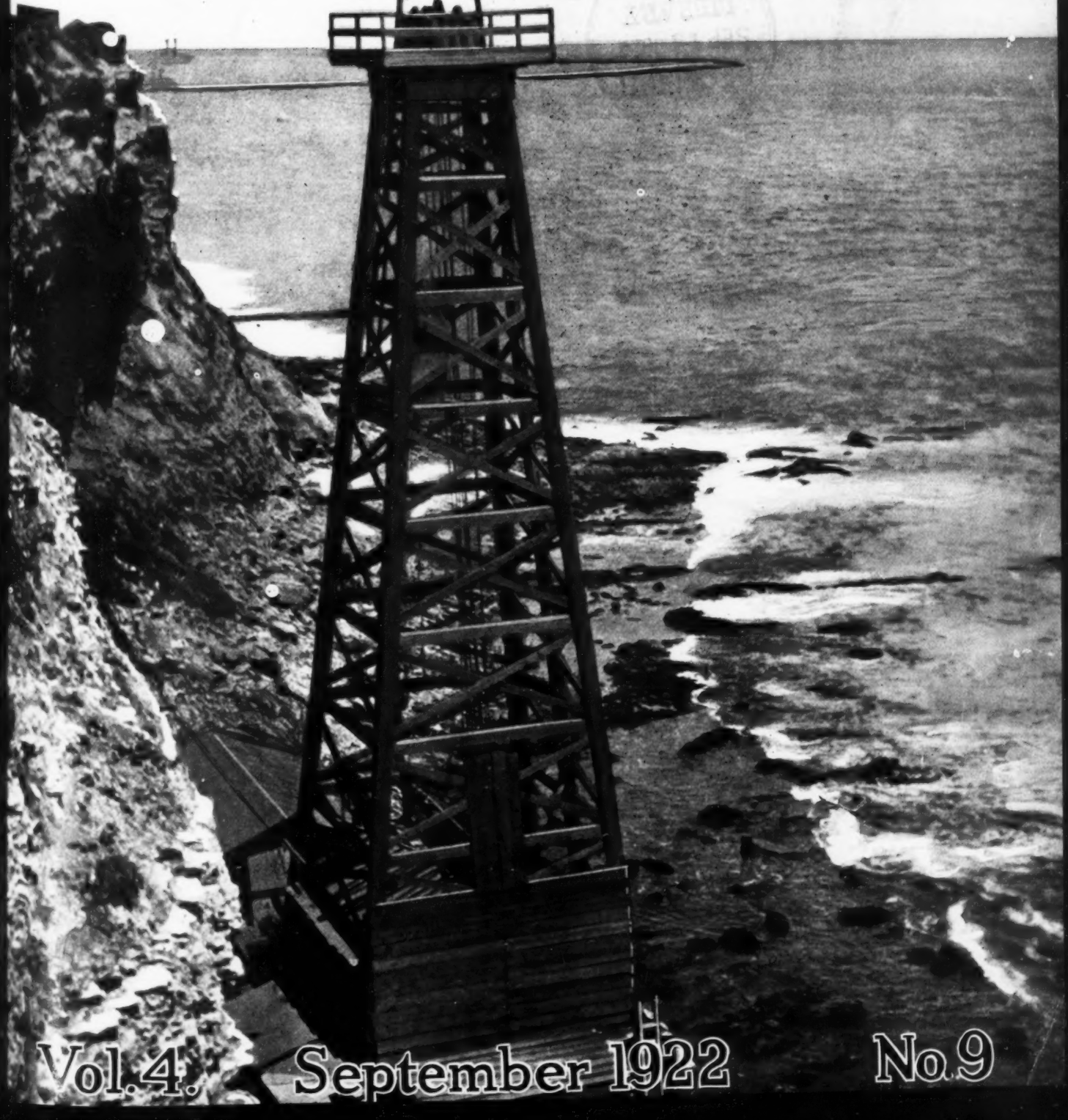
Construction - Road Making - Engineering - Industrial - Mining



Vol. 4. September 1922 No. 9

1897 **Autocar** 1922

Wherever there's a road

What a motor truck buyer wants to know

1. With whom he is personally dealing
2. Responsibility and experience of manufacturer
3. Trade in, rebuilding and reconditioning policy
4. Design and mechanical superiority
5. What size and weight truck he needs
6. What load he can legally carry
7. Insurance and license expense
8. Necessary gas and oil consumption
9. Cost of replacement parts
10. Assurance of immediate service

Because he wants continuous economical transportation

4 cylinder 4 to 6 ton Autocars

Wheelbase lengths	120 ins.	156 ins.
Maximum overall capacity (chassis, body and load)	22,000 lbs.	22,000 lbs.
Unladen chassis weights only	7200 lbs.	7400 lbs.
Prices (chassis)	**$3950**	**$4100**

4 cylinder 2 to 3 ton Autocars

Wheelbase lengths	114 ins.	138 ins.
Maximum overall capacity (chassis, body and load)	15,000 lbs.	15,000 lbs.
Unladen chassis weights only	5200 lbs.	5350 lbs.
Prices (chassis)	**$2950**	**$3075**

2 cylinder 1½-2 ton Autocars

Wheelbase lengths	97 ins.	120 ins.
Maximum overall capacity (chassis, body and load)	11,000 lbs.	11,000 lbs.
Unladen Chassis weights only	3600 lbs.	3700 lbs.
Prices (chassis)	**$1950**	**$2050**

2 cylinder 1½-2 ton Autocars (Rebuilt)

Wheelbase lengths	97 ins.	120 ins.
Maximum overall capacity (chassis, body and load)	11,000 lbs.	11,000 lbs.
Unladen chassis weights only	3600 lbs.	3700 lbs.
Prices (chassis)	**$1650**	**$1750**

Prices F.O.B. Ardmore, Pa.

2 cylinder 1½-2 ton Autocars (Reconditioned)

Wheelbase lengths	97 ins.	120 ins.
Maximum overall capacity (chassis, body and load)	11,000 lbs.	11,000 lbs.
Unladen chassis weights only	3600 lbs.	3700 lbs.

Prices (chassis) . . $1100 to $1400

A motor truck is only as good as the service behind it

THE AUTOCAR COMPANY, Ardmore, Pa., (Established 1897)

THE AUTOCAR SALES AND SERVICE COMPANY

New York	Boston	Philadelphia	Pittsburgh	Chicago	San Francisco
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Between the Devil and the Deep Sea

CONSTRUCTION in one form or another has its share in every field of human endeavor. Everything man does calls for some sort of construction. Before he can sail the seas, he has to build a ship. Before he can engage in manufacturing he has to put up a building in which to do his work. Even the famous Curb Market, which carried on its business for so many years in the middle of a New York street, finally called in the architects and contractors and is now established in a fine building.

Our cover this month shows an oil well on the Pacific Coast. The first thing a well driller has to do is to construct his derrick and the men who built this one had a job on their hands. Crowded on a narrow beach between a high cliff and the pounding surf, this derrick shows that the oil men must know a thing or two about construction. It is a job of which the most experienced contractor among the readers of SUCCESSFUL METHODS might well be proud. That is why it is on the cover.

A Common Labor Shortage

MANY signs indicate that there will be a shortage of common labor in most parts of the country by spring. How serious the scarcity will be and how long it will last remains to be seen. There are various factors, however, which will almost certainly tend to make common labor very scarce next year.

Restriction of immigration and the return to Europe of alien labor in the last two years have been two big factors in making a labor shortage. Settlement of the soft coal strike showed quickly what the big steel companies thought the effect of that would be on them. No prophet is needed to estimate the effect on the demand for labor of a settlement of the hard coal and the rail strikes. Practically all authorities are agreed that we shall have an expanding business movement in this country for some time to come.

Few construction men outside of the big financial centers seem to have sensed what the combination of these conditions will mean. Very little more thought is being given to labor saving machinery than in times of a surplus of labor. This is particularly true on small and medium-sized jobs.

Next year with common labor scarce, costly and inefficient many concerns which have clung to old-fashioned hand-labor methods will be forced to use machinery. It would be good business for them to make the move now. By doing so they can save money at present wage rates. They can also get organized so that when work starts up in the spring they will be ready to kick off at full capacity. There is more risk in delaying action on such a plan than in gambling that labor will be cheap and plentiful.

A Reversed Current

PRIOR to the late war, American road builders went to Europe to study the methods and types of construction used by engineers on the other side. Our text books on roads also were based largely on European practice. Every speech made by an American highway builder back in the nineties referred in glowing terms to the old Roman roads and to the excellent European macadam construction.

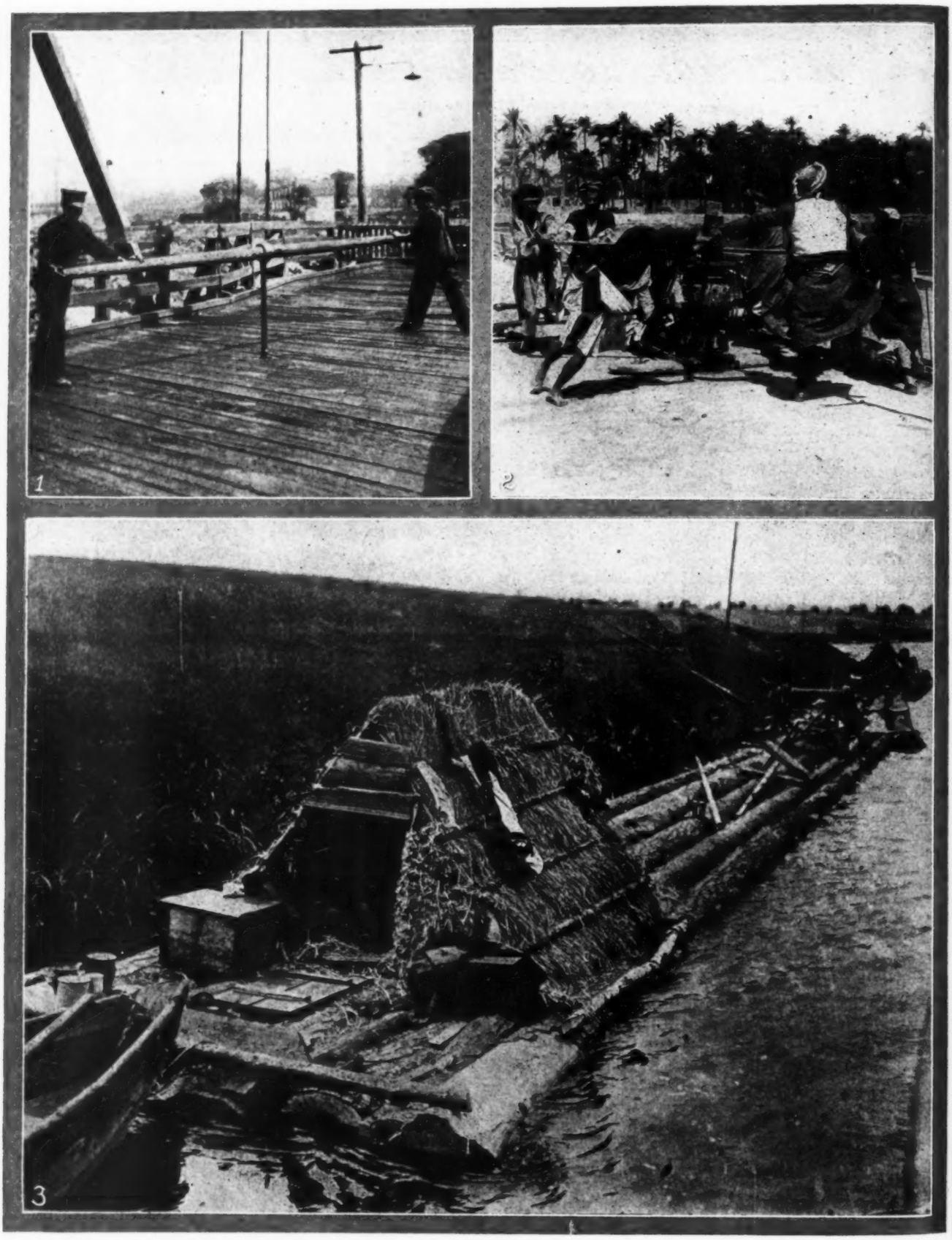
The situation now has been completely reversed by the road surface required to withstand motor vehicle traffic. But European engineers have been slow to change their methods of construction. The war had a good deal to do with this. The natural European conservatism evidently has been the main factor, however, in the retention of the methods and types of construction that stood up under slow-moving, steel-shod traffic.

American highway builders consequently no longer look to Europe for leadership on types and methods of highway construction and surfacing. Much still could be learned from Europe in the way of careful work and methods of maintenance. But the fast, economical American methods of building concrete and brick roads, and concrete base for other surfacing, have been very little used abroad until lately.

Last year a few road engineers from Europe came here to study our methods. This season at least 250 highway builders from abroad have come to see how we do it. Many of them have gone home only partly convinced that American methods are right. Few with whom we have come in contact will adopt right off our methods and the machinery required to make such methods economical.

Sooner or later engineers of other countries will come to realize that the vast program of construction in this country has made it possible to develop the best known methods of road building. The tide of visitors which already has set in from abroad then will grow rapidly and the United States will replace Europe as the Mecca for the road builders of the world.

The Old-Fashioned Methods

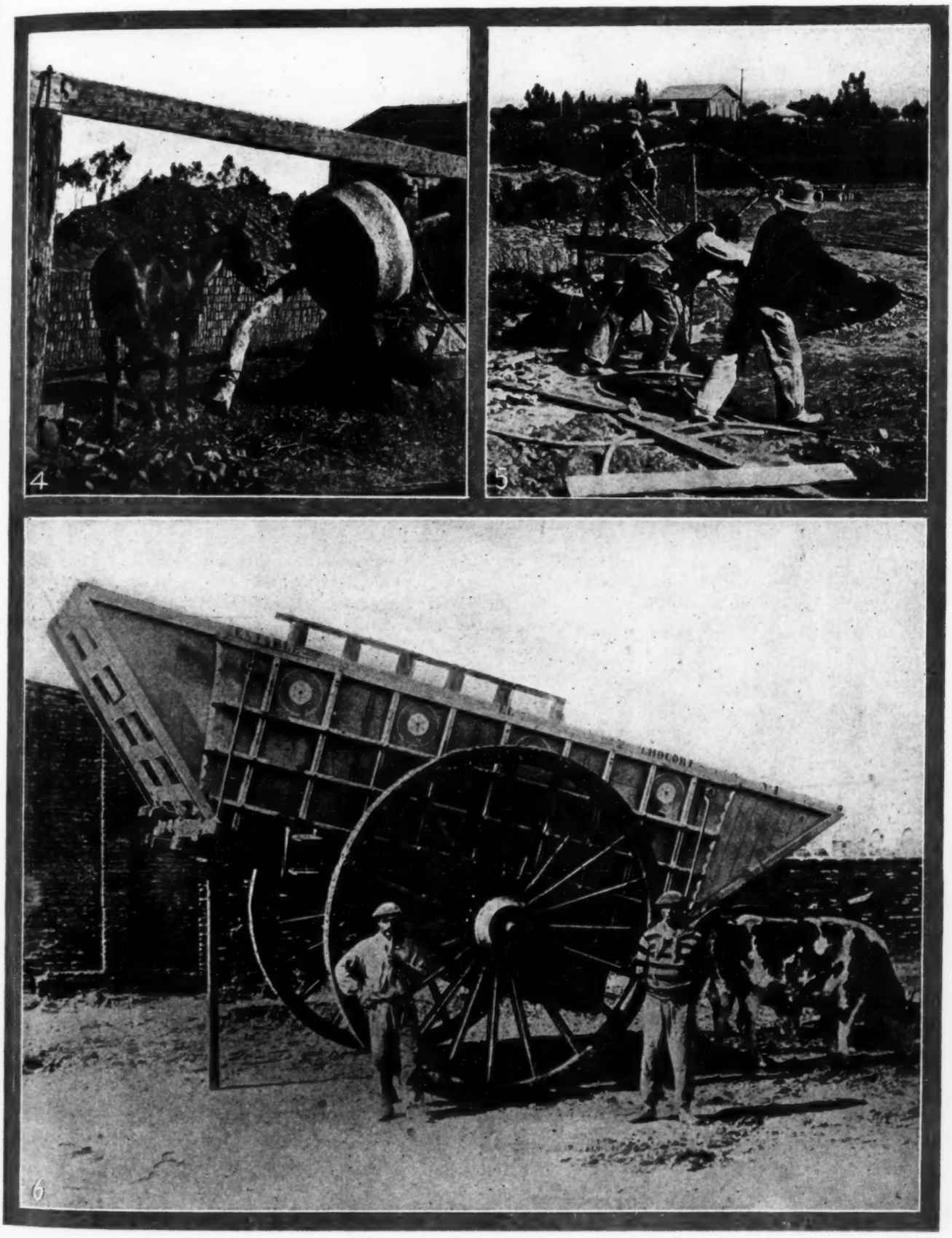


1—This primitive two-man drawbridge is within the limits of New York City. It has been blacklisted, however, and will soon be replaced by a modern structure. © *Keystone*

2—Labor is cheaper in Mesopotamia and a full crew mans the capstan on the bridge of boats which crosses the Tigris River at Bagdad © *Underwood & Underwood.*

3—The German lumberman ships his logs to market in clusters of two and three. He goes along to make sure that they get there safely. © *P & A Photos.*

Still Have Their Devotees



4—They make bricks this way now in Egypt where the Children of Israel used to manufacture them under the yoke of the Pharaohs. © *International.*

5—Making adobe bricks in the way the Spanish Fathers made them. These men are engaged in the work of restoring the old San Fernando Rey de Espana Mission in California. © *International.*

6—Down in Argentina they don't expect to find concrete roads, so they build wagons like this which can navigate despite mud holes. © *P & A Photos.*

GILBOA DAM ONE QUARTER FINISHED

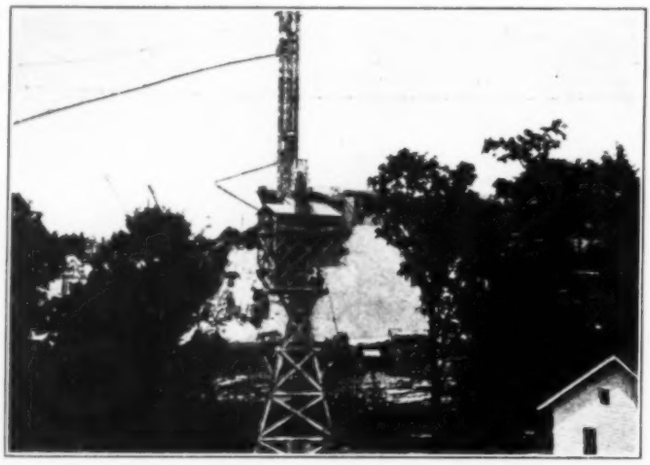
Aerial Tramways Transport and Handle Materials on Big Reservoir Job

By Robert S. Arthur

"ALL any job consists of is the transportation and handling of the materials—get that whipped and you've got the job whipped."

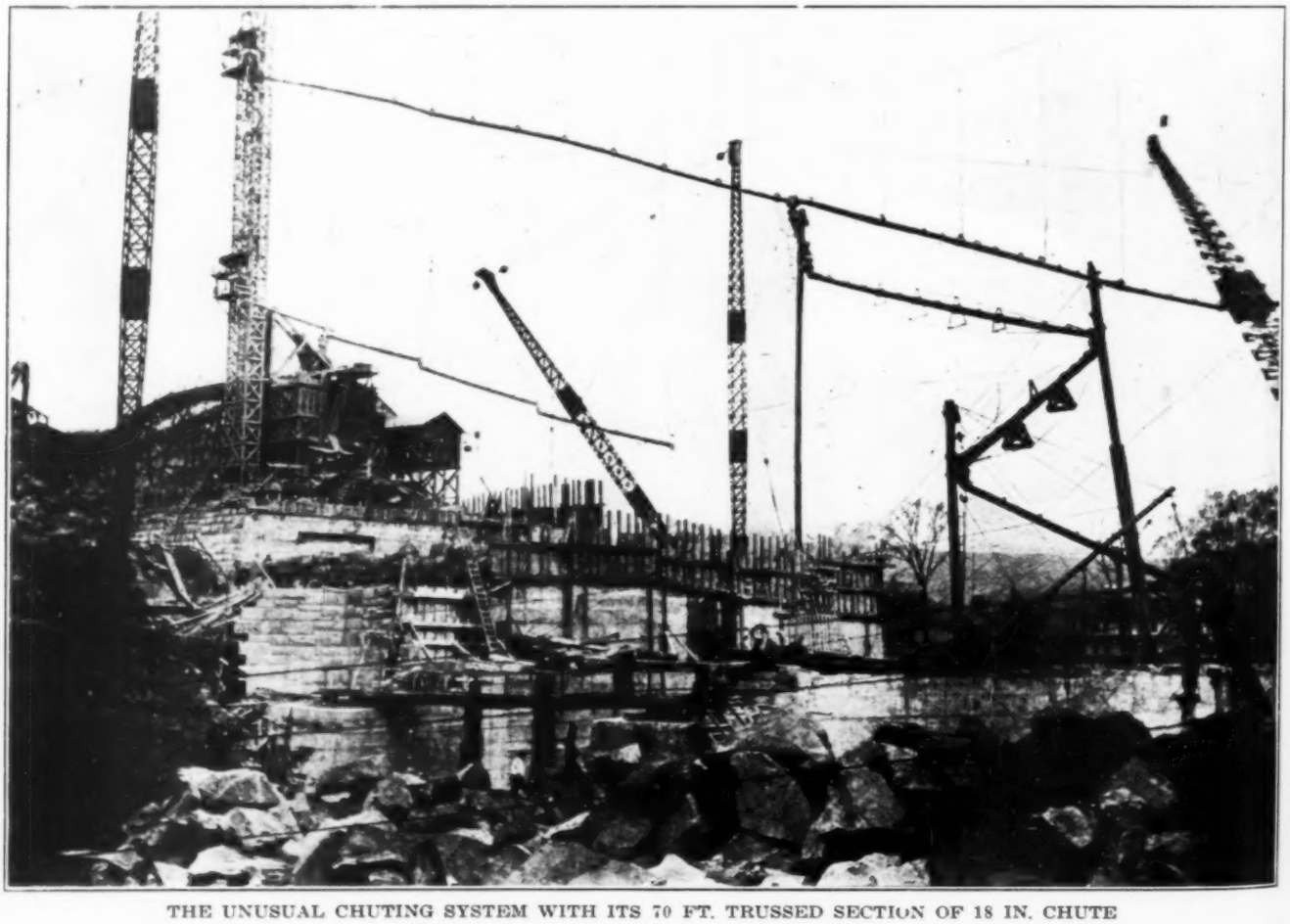
This is what J. T. Frame, superintendent for the Hugh Nawn Contracting Co., has to say about the big $7,500,000 dam which is being constructed across the Schoharie River in the Catskill Mountains for the Board of Water Supply of New York City.

In the June, 1921, issue of Successful Methods a description of this work was given. It told how this dam, when completed, will form an artificial lake ⅝ of a mile wide and 5 miles long. At that time, however, the method of handling the large and small aggregate had not been put in use, and the chuting system for the distribution of concrete for the main section of the dam was not in operation.



THE CENTRAL MIXING PLANT WITH TWO MIXERS AND DOUBLE TOWER

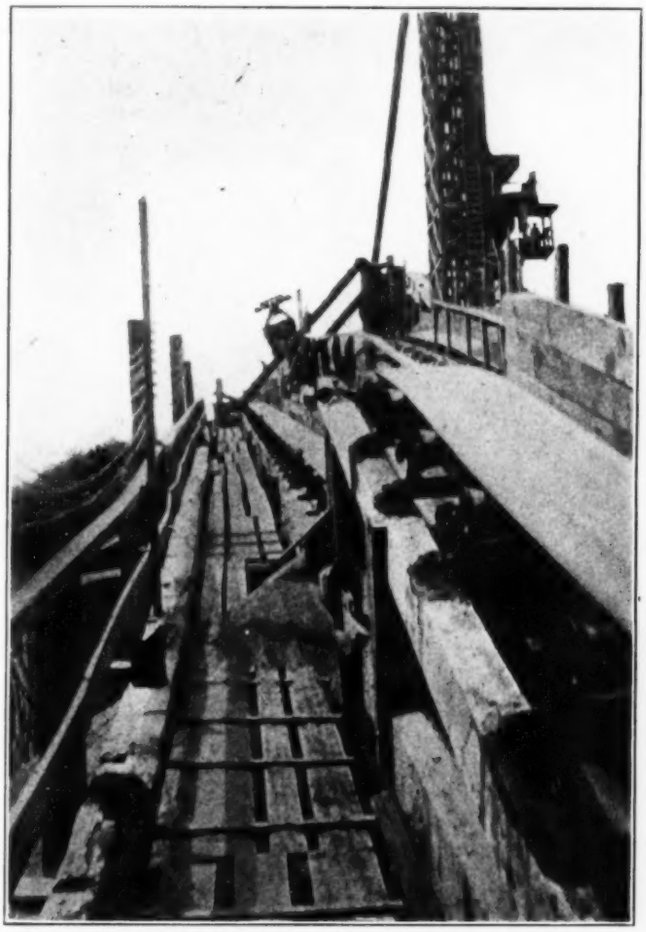
To begin with, the aerial tramways assemble all the materials at a central mixing plant. Cement is carried for a distance of 3300 ft. at the rate of 500 bags per hour. Stone is quarried on the mountain side and brought in 1-yd. buckets a distance of 3800 ft. at the rate of 1000 cu. yd. per hour. Sand is delivered by means of another aerial tramway 600 ft. in length at the rate of 70 cu. yd. per hour. The extent to which the overhead tramways are used is unusual on contracting work. They are all independent and function like clockwork. In addition to the aerial tramways there is a main cableway having a span of 1900 ft., which in addition to handling the excavated material, transports all manner of equipment



THE UNUSUAL CHUTING SYSTEM WITH ITS 70 FT. TRUSSED SECTION OF 18 IN. CHUTE

over the site of the work. The cableway has a capacity of 10 tons.

The concreting plant at which the material is assembled consists of a double wooden tower 180 ft. high, at the base of which are 2 motor-driven 2-yd. mixers. The chuting system, including as it does a clear, unsupported span of 18-in. steel chutes, is worthy of close study. One of the illustrations shows this line of chutes and gives a good idea of the problem which the contractor had to solve. For construction purposes and in order to provide contraction joints, the dam is divided into 76-ft. sections. The steps on the downstream side are approximately 20 ft. in height. The problem was to span the stream control section which occurs in mid-stream and which is not to be concreted until the last thing. As shown in the illustration, a 70-ft. section, heavily trussed, of 18-in. steel chute, with supports at the ends only, was used. The standard type of 14-in. steel chutes was used on the shorter radii. To give a maximum flexibility to the distribution system, lines of 14-in. chutes running from the main towers and at different elevations were used.

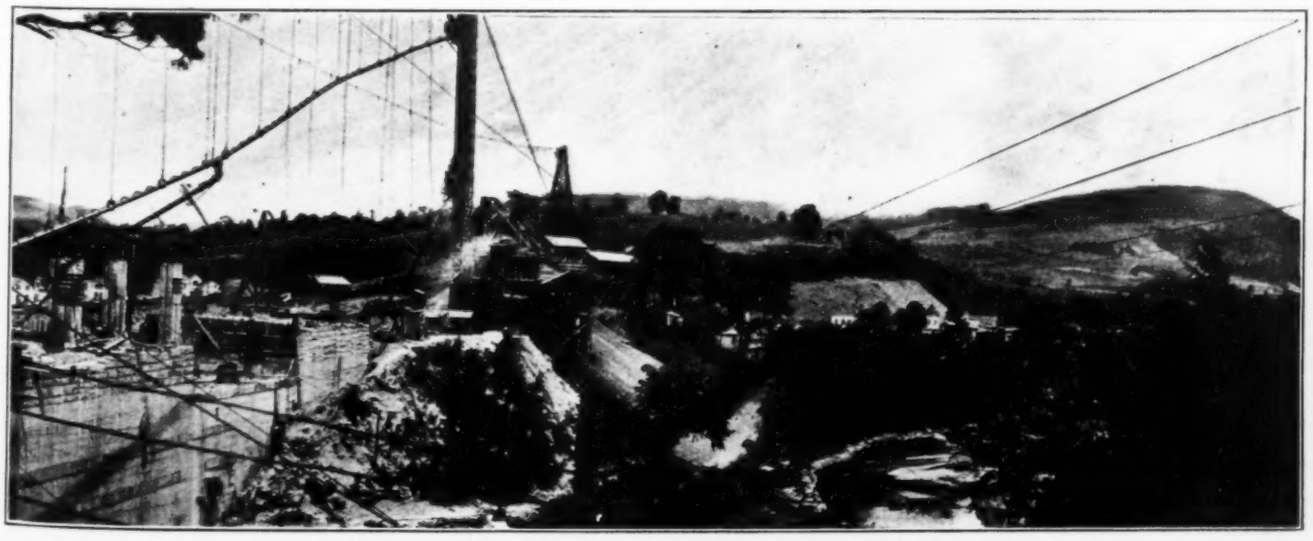


THE BELT AT THE RIGHT DELIVERS THE STONE AND THE BUCKET IN THE BACKGROUND SUPPLIES THE SAND

The stream control section consists of a 45-ft. arched section flaring out to 58 ft. on the upstream side. When the dam is completed and all the control mechanism has been installed at the tunnel intake, an 8-ft. by 8-ft. sluice gate will be set and the remainder of the opening bulkheaded. The control section will then be concreted and finally by means of pipes, grout will be forced in under pressure to insure its being completely sealed.

A feature of the design, which allows the contractor a considerable advantage, is the laying up in advance, on both the up and downstream faces, of cut stone laid in random ashlar. This makes the use of forms on the face unnecessary, the masonry being backed with cyclopean concrete. One of the photographs shows the derricks, which are used to handle the cut stone and the plums or cyclopean stones.

The hum of activity is not confined to the daylight hours as flood lights of 500 watt lamps placed high on the concrete towers permit night shifts to work with little loss in efficiency. In fact, the little town of Gilboa, which is to be completely swallowed by the waters of the reservoir, is gasping its last in a lively fashion. For concreting, quarrying and excavating two 8-hour shifts are worked. The sand washing plant and the aerial tramways are in operation continuously. All of the



A GENERAL VIEW OF THE JOB FROM THE UPSTREAM SIDE

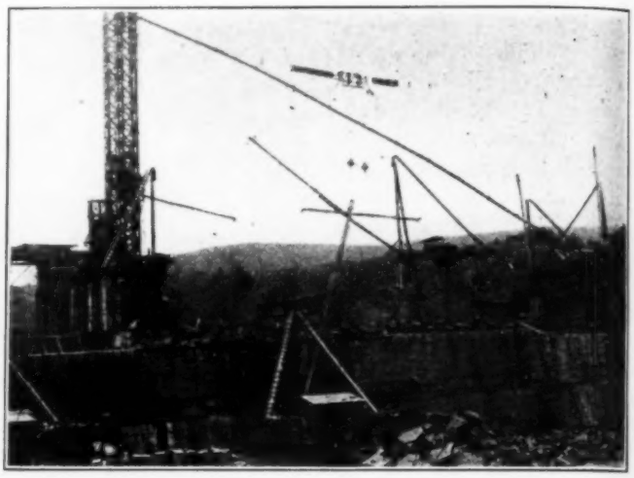
equipment, with the exception of steam shovels, of which there are six, is electrically operated. It is truly an electrical job.

Although the dam site is rather inaccessible, being 4

VIEW OF SAND WASHER PLANT

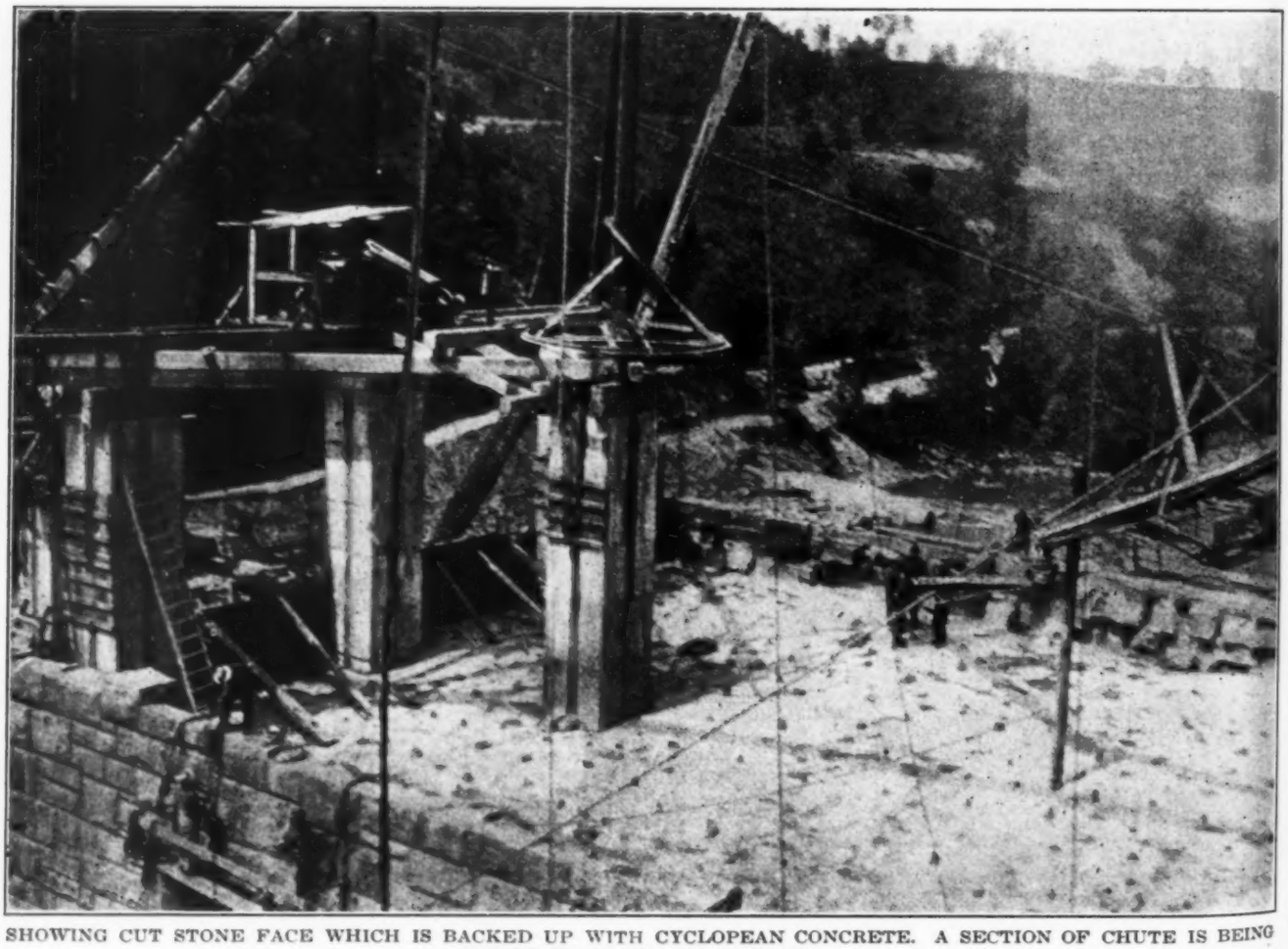
miles from the railroad by mountain road, the contractor took advantage of sand and stone deposits near by. Cut stone is quarried about 1 mile downstream and is brought to the site on flat cars with dinky engines over 36-in. gage tracks. Stone for concrete is quarried and crushed on the side of Stevens Mountain a mile and a half distant. Three miles up the Schoharie River sand is excavated with a steam shovel and transported to a washing plant by 4-yd. dump cars. There it is washed and screened and sent over to the mixing plant by aerial tramway, a distance of 600 ft.

H. P. Nawn is in charge for the Hugh Nawn Contracting Company. N. S. Brock is Works Manager,



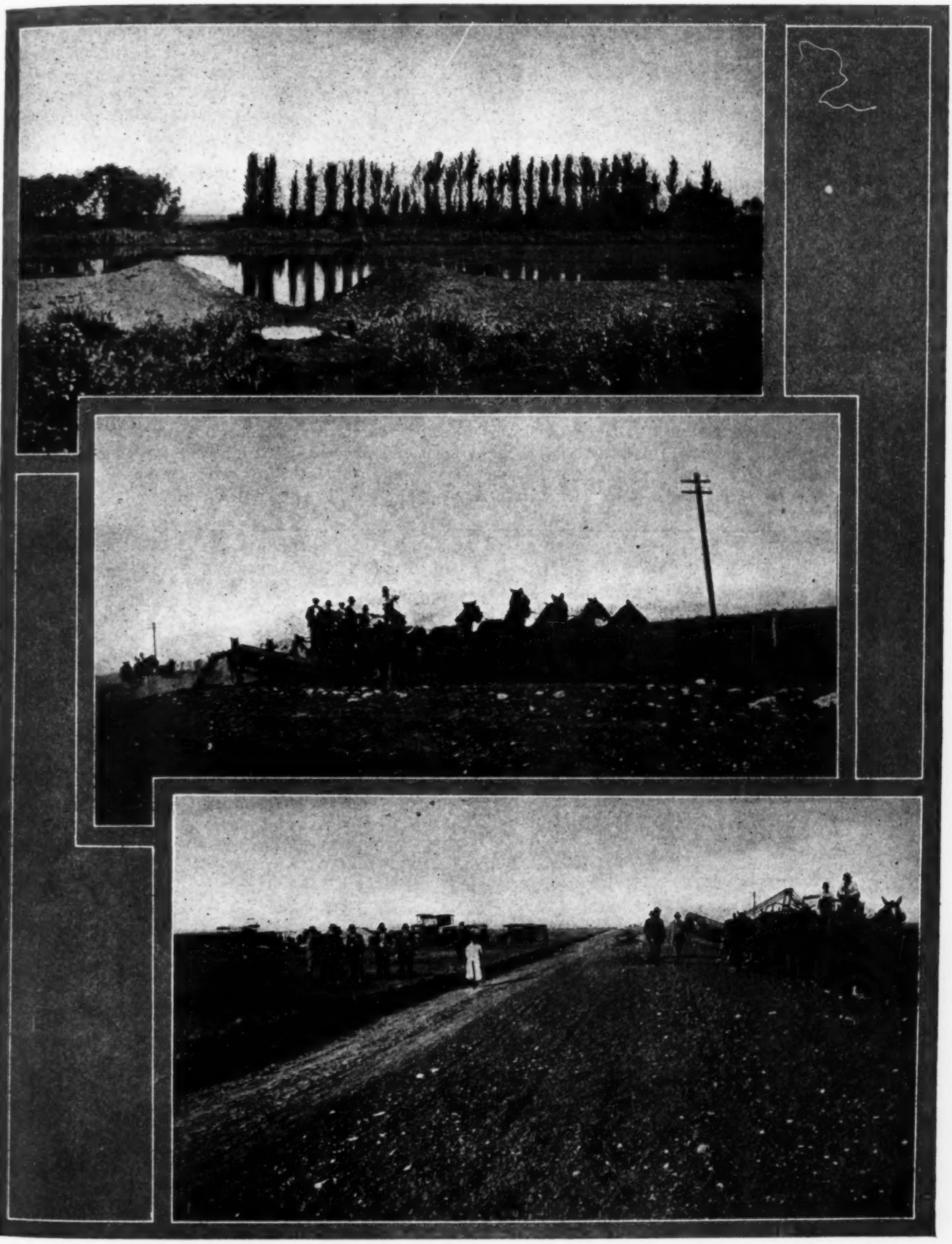
DOWNSTREAM VIEW. CABLEWAY TRANSPORTING CHUTE SECTIONS

G. W. Lewis is his assistant, J. T. Frame is Outside Superintendent, and N. M. Fitzgerald is Engineer for the contractors. The design and construction is in charge of the Board of Water Supply, New York City.



SHOWING CUT STONE FACE WHICH IS BACKED UP WITH CYCLOPEAN CONCRETE. A SECTION OF CHUTE IS BEING RAISED TO PLACE BY DERRICK

Building Roads in South America

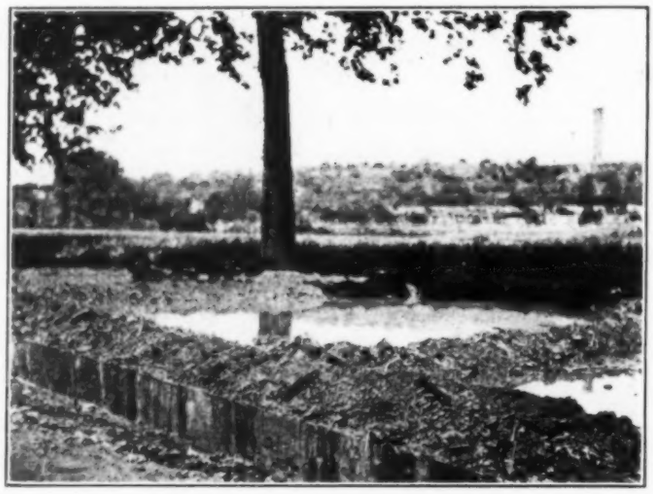


An elevating grader is accomplishing satisfactory results on this 80-mile road job in the province of Buenos Aires. It has been in operation for about five months and has graded half the distance although the road is 50 ft. wide and the soil of such a nature as to make grading difficult.

BUILDING THE FIRST CONCRETE ROAD IN SPAIN

American Methods Followed Closely on a Five-Mile Project.

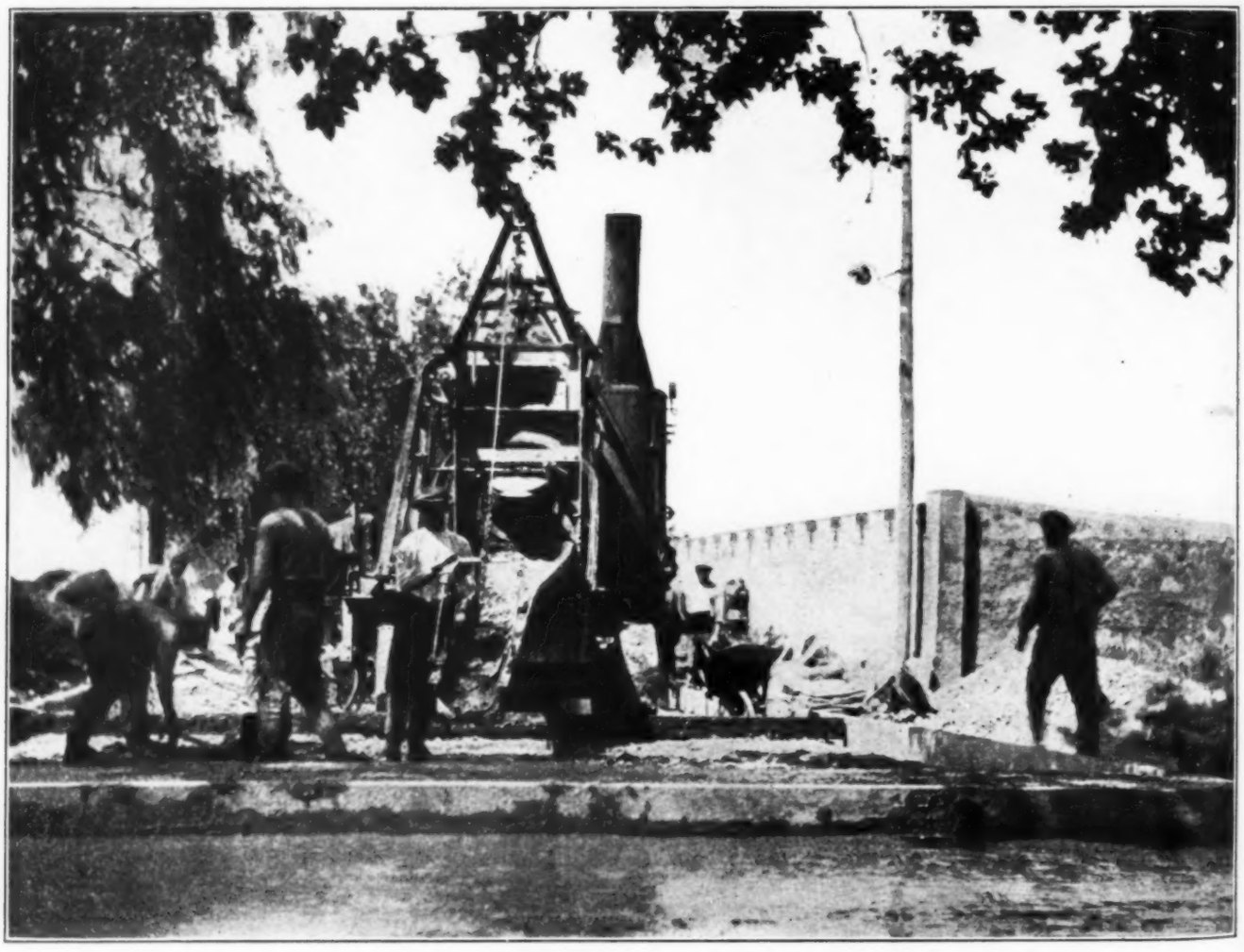
CONSTRUCTION work is progressing rapidly on the first concrete highway in Spain. This highway is to be about five miles in length, extending from Barcelona to Cornella on the main road to Madrid. The project is attracting wide attention all over Spain on account of the novelty of the construction to Spanish engineers and road users. Accordingly, great care is being taken to make a thoroughly satisfactory job.



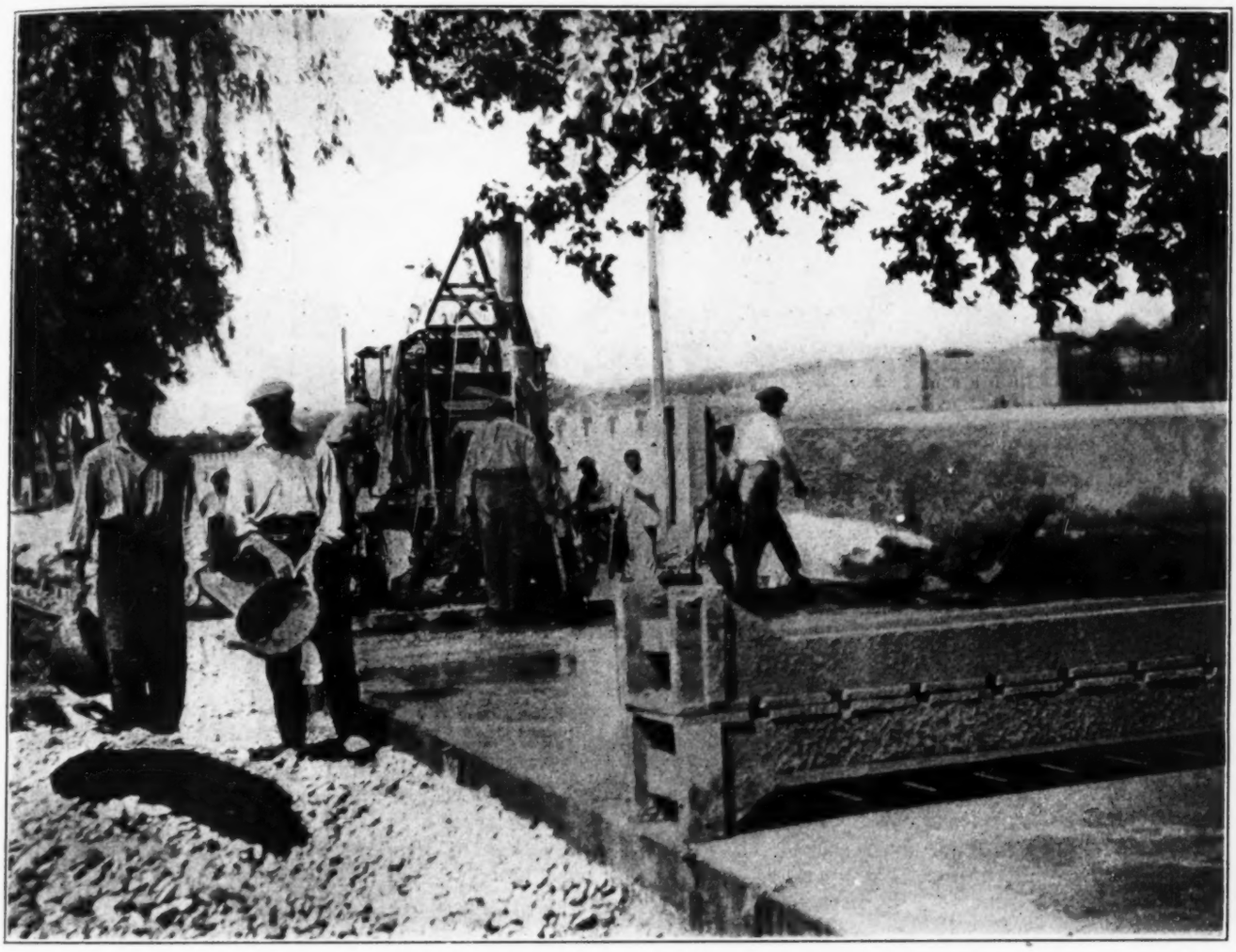
CURING BY PONDING

Part of the location is through villages, and the balance is in open country. All of the location is on an old highway, which carries a heavy traffic of two-wheeled carts and some motor cars and motor trucks. The two-wheeled carts offer a desperate problem to an engineer in attempting to provide a road surface to carry such traffic satisfactorily. All these carts have steel-tired wheels. Some are of large capacity, loads of 6 to 8 tons not being uncommon. As none of the wheels are over 4 in. wide, their destructive effect under such loads is very great.

The highway was surfaced at least 100 years ago with broken stone macadam. Since then the surface has been repaired from time to time until the total depth of macadam was nearly 20 in. The top of the macadam was deep in dust during the dry season and contained many holes. The main body of the thick macadam



THE PAVER AT WORK. THE HAND TAMPER IS SHOWN IN THE FOREGROUND



VIEW SHOWING THE FLOATBRIDGES

was, however, almost as dense and as rigid as solid rock.

In order to prepare the surface of the macadam to receive the concrete it was first cleaned thoroughly and then scarified to a depth of 3 to 6 in. A steam roller was next used to consolidate the loosened stone. The slight crown in the subgrade was shaped up with the scarifier and roller and finished accurately by hand. As there are no frosts in that section of Spain the moisture content in the subgrade thus prepared is expected to be practically uniform under the concrete slab. Certainly, the latter should have a footing which ought to carry any loads which the concrete can withstand.

On account of the character of the traffic, an unusually dense mixture of concrete is being employed. The cement used is furnished by a Spanish company, which has done much in promoting concrete roads in Spain. The coarse aggregate is gravel of varying size. The mixture of materials is varied as required to obtain the densest possible concrete.

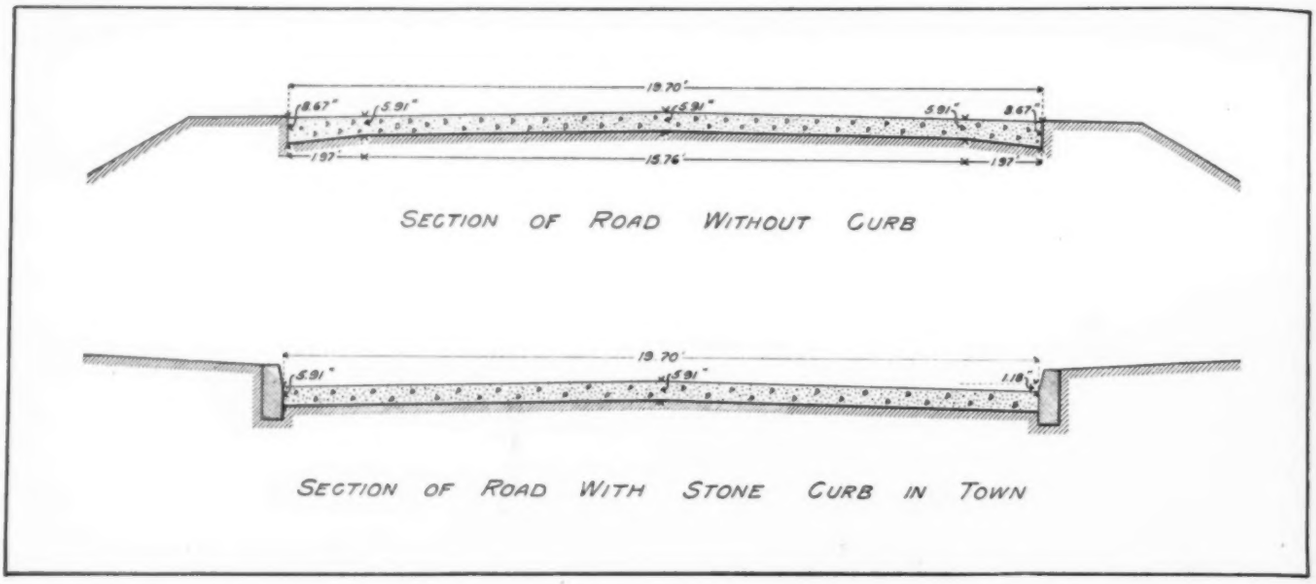
Typical sections of the concrete slab are shown in an accompanying sketch. The increased thickness in the section without curbs is specially noteworthy. The slab also should have ample thickness, in view of the very solid foundation and the rich mixture.

The concrete is mixed in a paver made in the United States. The materials are piled on the subgrade and delivered to the charging hopper in wheelbarrows. Since the subgrade ahead of the mixer is the freshly-rolled macadam, and no rain is expected during the time the work is under way, no foreign material gets into the sand or gravel.

Methods common in the United States were followed closely in striking off, tamping, finishing and curing the concrete. One of the pictures shows a timber under the chute of the mixer. This timber was used to support the steel plates of the contraction joints which are placed at intervals of about 80 ft. The timber in the foreground of this same picture is used as a strike-off and tamper.

Finishing is done by hand. The men work from bridges, two of which are piled together in the photograph in which the two men appear with baskets. When this photograph was made these men were spending most of their time getting into it. Human nature is much the same everywhere, after all, regardless of the language or environment.

Six hours after the concrete is finished it is ponded, as shown in one of the pictures. On account of the very dry climate, great care is observed to keep the slab damp until the concrete has set thoroughly. The material for the dams was intended all to be placed with wheelbarrows. On account of the trees along



SECTION OF ROAD WITHOUT CURB

SECTION OF ROAD WITH STONE CURB IN TOWN

the side of the road—and the preference of the Spanish workmen—much material is placed with baskets.

The project is largely experimental to the Spanish engineers and officials. They expect to watch very closely the manner in which the concrete performs under traffic. If satisfactory results are secured, a large mileage of concrete highways probably will be built in Spain in the next few years.

Some of the methods on this project may appear primitive, or at least possible of being done much cheaper by hand. It was not practical, however, to purchase a complete outfit of equipment for this more or less experimental job. In spite of the resulting handicap, about 220 ft. of slab approximately 20 ft. wide, is being completed daily. Reports also are to the effect that good results are being obtained.

The road is being built under the supervision of Blas Sorribas, Chief of Public Works of the Province of Cataluna, and his assistant, Tomas Ribera. The work is being done by Tomlinson & Soler, who practically have introduced concrete roads in Spain, and to whom great credit is due for the speed and the excellent results they are getting on this project under great handicaps as to equipment.

HANDLING STEEL REINFORCING

THE accompanying photographs show the method of handling the steel reinforcing in very long piles which is used along the San Francisco water front. The reinforcing is assembled on five supports

REINFORCING PLACED ON SUPPORTS

as shown on the right in the photograph above. When ready to be placed in position in the wooden forms, three wooden horses are placed in the position shown in the other photograph. Each of these horses is equipped with a chain hoist. These hoists are then attached to the reinforcing, the reinforcing is raised upon the supports and then moved to the right to a point directly over the wooden forms, and then lowered into the position as shown in the photograph below.

It will be noticed that the top of each horse is tipped in the direction in which the reinforcing is to be moved, thus requiring but little effort on the part of the workmen to move the chain hoist along the top of the horses.

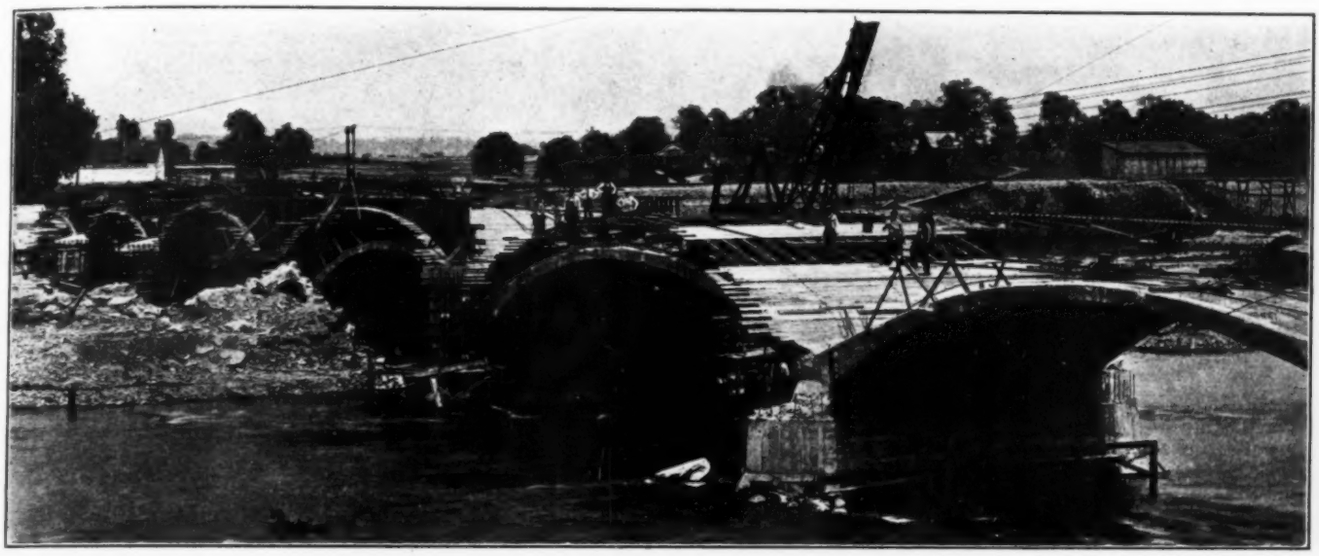
LOWERING THE REINFORCING INTO POSITION

This method of handling the reinforcing has been in use for some time and has proved a time and labor saver besides requiring little appartus.

OLD ARCHES SUPPORT FALSEWORK FOR NEW BRIDGE

Economy of Construction and Prevention of Flood Damage Obtained by This Method

By Ivan E. Houk, City Engineer, Dayton, Ohio



THE old concrete arches are being used as supports for falsework in reconstructing the Adams Street Bridge at Troy, Ohio, the reconstruction being necessary on account of the changes in the river channel made by The Miami Conservancy District in connection with its general flood prevention work. The area of the bridge waterway, which was entirely inadequate in the case of the old structure, is being increased by building new arches over the present spans, from 3 to 8 ft. higher than the old, and by adding three new spans at the northeast end of the bridge.

Before beginning the falsework construction, the sidewalks, roadway, arch fill, and spandril walls of the old bridge were removed, thus leaving the arch rings bare. The piers were then strengthened so as to provide safe foundations for the new bridge, this being done by building coffer dams around the old piers, driving piles in the river bed, and then widening the lower parts of the piers by pouring concrete on top of the piles.

The falsework then was built up from the tops of the old arches. This resulted in a saving of considerable expense in the carpenter work inasmuch as it would otherwise have been necessary to begin the falsework at the river bottom.

It also had the advantage of leaving the river channel unobstructed and thus preventing possible flood damage. While the larger floods in the Miami Valley occur in the late winter and early spring it is not at all unusual for freshets great enough to completely destroy such falsework to occur during the summer.

The photograph shows clearly the way in which the work is being done. At the extreme left of the picture is one of the arches of the old bridge showing nothing left but the bare arch ring which later will be removed. The other arches show the false work resting on them in various stages of construction. The widened piers also are clearly shown.

When the new bridge is completed, which will be sometime this summer, the river bed beneath the structure will be excavated with a dragline to such a depth that the old arches can be broken loose and dropped without obstructing the waterway. The broken edges of the old arches at the piers will then be covered with new concrete by completing the widening of the piers up to the bottoms of the new arches.

PENNSYLVANIA ADDS 224.6 MILES TO HIGHWAY SYSTEM

DURING the present construction season, and up until Aug. 17, the Pennsylvania State Highway Department has put down 224.6 miles of durable highway. This mileage is less than that constructed during the same period in 1921, due to the fact that not so many contracts are in force and also to the effect of the coal and railroad strikes.

During the latter part of July the coal situation began to interfere with the output of the mills supplying cement to approximately 200 contractors at work on Pennsylvania roads. When a settlement of the mine difficulties had been reached the car question became a serious one. In order to aid the contractors in overcoming this difficulty the Department began the collection of information to be presented, if necessary, to the State Public Service Commission and the Inter-State Commerce Commission in an effort to get cars for road material shipments.

A LAWYER ON A ROAD JOB

Applies Business Methods Where They Are Most Needed and Saves Contract

THE importance of sound business methods in construction work never was better illustrated than by the progress now being made on a 10-mile road job in North Carolina.

The present program of road building to cover 5000 miles of main roads in that State includes a great many miles of asphaltic concrete. This means a concrete base and header curb with a 2-in. wearing course.

CONCRETE BASE READY FOR ASPHALT SURFACE

One of these roads 10 miles long was bid in by a northern firm last fall and later sublet to a corporation from Baltimore. In April they sent representatives to build the road, who at once installed a central mixing plant. The road is in the eastern part of the State in a sandy section and is not adapted to a central mixing plant as the stone and mortar separate after being hauled over rough subgrade. The central mixing plant was built upon a flat car and was well constructed and equipped. Nevertheless it proved uneconomical and had to be discarded. Slow progress was made by the central mixing plant, and soon it was condemned by the engineers from the Highway Commission. Then the central mixing plant was changed to a central loading plant and a mixer was placed on the subgrade. Steel forms are required by the State specifications and are used here. A great deal of trouble was experienced in getting the trucks through the sandy subgrade, which was one cause of the slow progress. Gravel and sand came in by cars and were unloaded into storage piles and from there to a crane. Cement was shipped in by cars and demurrage paid on the cars rather than build a cement house.

After nearly two months of operation in which a very small amount of pavement was laid and a considerable amount of money lost, the Baltimore corporation decided

CLYDE WILSON STICKING SO CLOSE TO THE JOB THAT HE RUNS THE RISK OF BECOMING IMBEDDED IN THE CONCRETE

to send a man to North Carolina and find out what was wrong with the road and why it was not going ahead. This man was not an engineer or construction man but a successful lawyer, Clyde Wilson, of Baltimore, who is also a business man from the ground up. He only ex-

TRACTOR AND ROAD MACHINE WHICH MAKES THE SUBGRADE ALMOST PERFECT

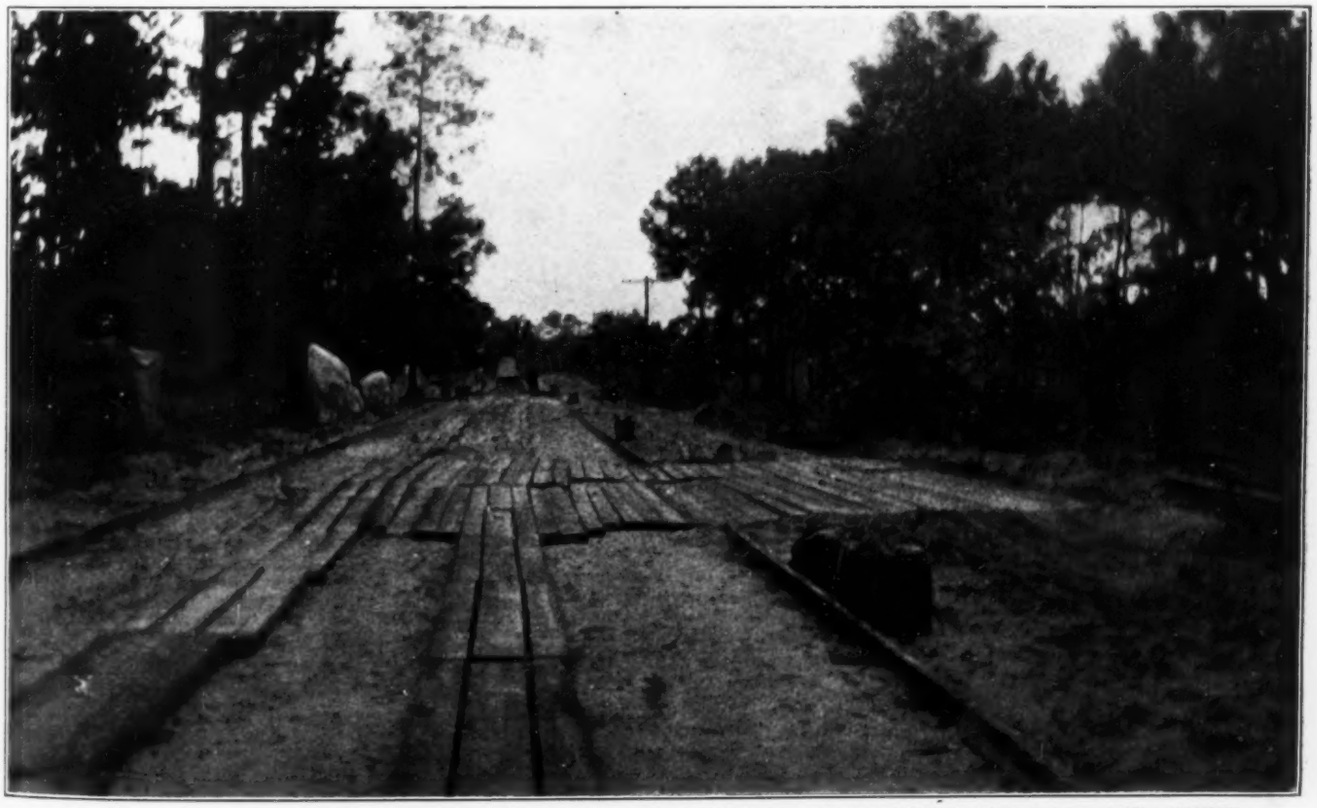
pected to stay a few days and find out what was wrong with the job, but has now reorganized the job and is building as much concrete base, if not more, than any contractor in the State. In one week in July he laid 3400 ft. in 5 days, or an average of almost 700 ft. per day.

When Mr. Wilson took over the job in June he studied it like any business to see what was wrong with it, and in about a month's time changed a job that had been averaging about 200 to 300 ft. per day into one that averages 700 ft. per day. He changed the system of supplying cement from cars to buying it by the barge at a saving of nearly a dollar a barrel. He let the contract by the ton for hauling the cement from the barge and had it piled about every 100 ft. on the subgrade covered with canvas. He found that there were not enough trucks so now has 12, each of which carries a full batch of gravel and sand. These cars dump directly into the mixer.

The North Carolina specifications call for a minute and a half mix and the Department of Tests gives 920 ft. of base as the maximum to be laid if the plant is working to 100 per cent efficiency. One day Mr. Wilson laid

A PORTION OF THE COMPLETED ROAD WITH ASPHALTIC SURFACE

872 ft., which is very near the 100 per cent efficiency mark, and so far as is known this is the record for the State. A great deal of trouble was found in getting the trucks through the sand until Mr. Wilson took over the job. Trucks were often stalled for some time in turning around, and held up the line of trucks behind.



PONTOONS ON SUBGRADE SHOWING PLATFORM WHERE TRUCKS TURN AROUND AND BACK INTO MIXER

As seen in one of the pictures he made a large number of portable platforms about 30 in. wide and 10 ft. long. He kept the grading well ahead and then laid down these "pontoons" on the completed subgrade. The small trucks run quickly over these "pontoons," and as the mixer goes ahead the "pontoons" are carried ahead and put down again. No turntable is used, but a 10-ft. section of form is taken out and the truck quickly backs into the hole on a platform made for it, turns and backs its load up to the mixer.

Previously much trouble was experienced in getting subgrade ready. Mr. Wilson obtained a tractor to which was hitched a small road machine which planes off the grade to nearly the right elevation so the hand-work is very small. This also is shown in a photograph.

Mr. Wilson has had practically no shut-down for materials, even during the strike, as he always planned days ahead, and in some way got materials and cars when most of the contractors could not. Probably because generally a lawyer gets what he goes after. Another unusual thing is that he never spends any time arguing with the engineers, as he is too busy getting the work done and has no time to argue. In fact, the engineering force on his contract is the smallest of any similar contract in the State.

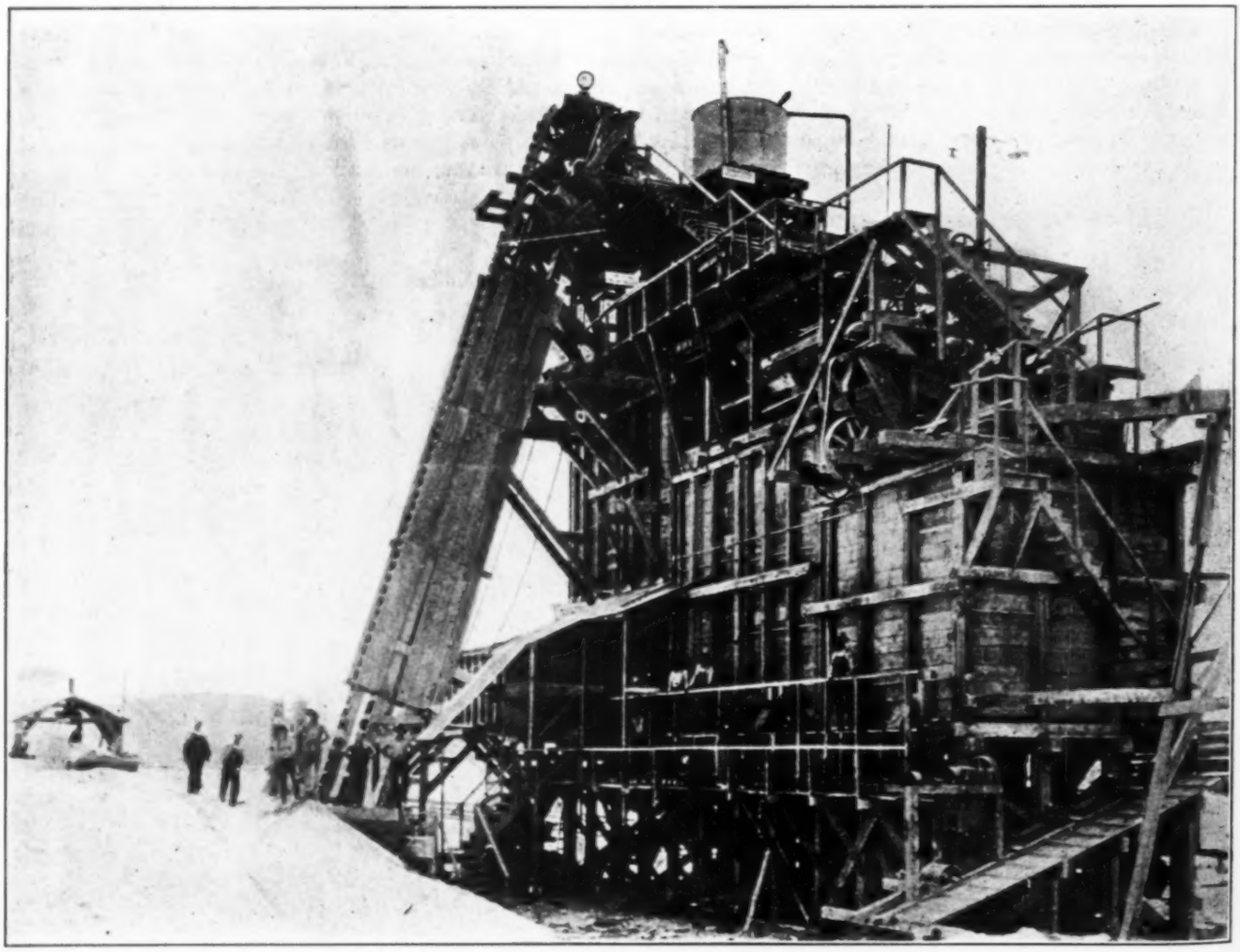
When Mr. Wilson took over this project he was unable to tell exactly how the business end stood, so he at once set to work to get his office in shape. Now, if you go in his office he can show you in one minute how much it cost to run the job yesterday and how much he received for the day's work. A picture is shown of the road completed after the asphaltic concrete top is laid.

The North Carolina highway work is under Charles M. Upham, chief engineer, and Frank Page, chairman of the commission, and Mr. Wilson gives them much credit for their co-operation.

STATE OWNS GRAVEL PLANT

NEVADA has been experimenting for more than a year with a state-owned and state-operated gravel plant located at Lahontan on the Tonopah branch of the Southern Pacific Railroad.

The State Highway Department is operating the plant and it is supplying sand and gravel for highway construction over a considerable territory. Numerous tests were made before the site was selected and at the place chosen about 300,000 tons of gravel were within easy reach of the hopper.

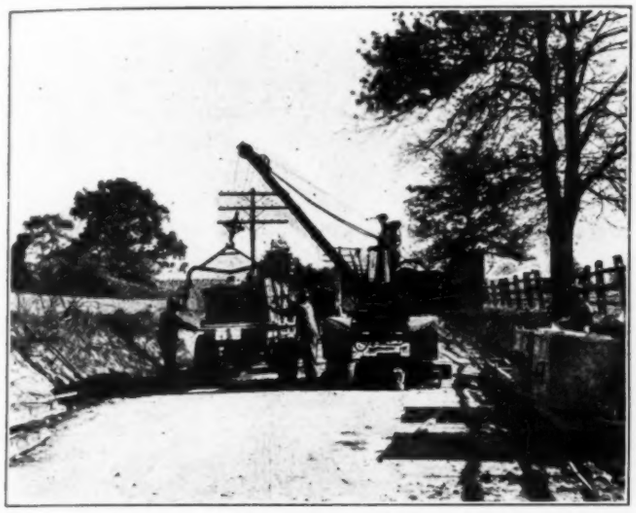


THIS GRAVEL PLANT IS OWNED AND OPERATED BY THE STATE OF NEVADA

TRUCKS HAUL INDUSTRIAL CARS ON ROAD JOB

Cooperate with Locomotives in Getting Materials from Proportioning Plant to Mixer on Pennsylvania Highway

ON a long haul, which contained several steep grades, Winston & Company, contractors, of Pottstown, Pa., developed a combination of truck and industrial railroad haul that was particularly efficient in transporting batches to the mixer from a central proportioning plant.



TRANSFERRING BATCHES FROM TRUCK TO CARS

At the beginning of the 8.35 mile project, which is between Westchester and Pottstown, the industrial railway and locomotives alone were used. As the haul increased, locomotives were replaced by trucks, which, running on the completed pavement, hauled trains from the loading plant to a point near the end of the pavement which had been completed 21 days previously. The locomotives were used to deliver the trains to the mixer, past newly laid pavement. This system avoided the purchase of additional locomotive equipment, as one truck develops sufficient power to haul a train up the steepest grade.

AT THE LOADING PLANT

A TRUCK HAULING LOADED CARS TO THE MIXER

The length of the industrial haul averaged about two hauls for each kind of motive power, and as the curing period expired the length of haul with the truck as motive power was advanced toward the mixer. Very little trouble was experienced with derailment, due to the side pull of the trucks on the industrial cars. In returning the empty trains to the loading plant, the truck was hooked to the rear of the train so as to control the speed on the down grades. A gasoline locomotive was in constant use at the loading plant for switching purposes.

From a second proportioning plant on the same job the batch boxes were hauled from the proportioning plant to the industrial railway and transferred from the truck to the cars by means of a gasoline driven, revolving, two-ton crane. The whole transfer operation required about 5 minutes with a crane operator, the truck driver and two laborers.

ELIMINATING VIBRATION

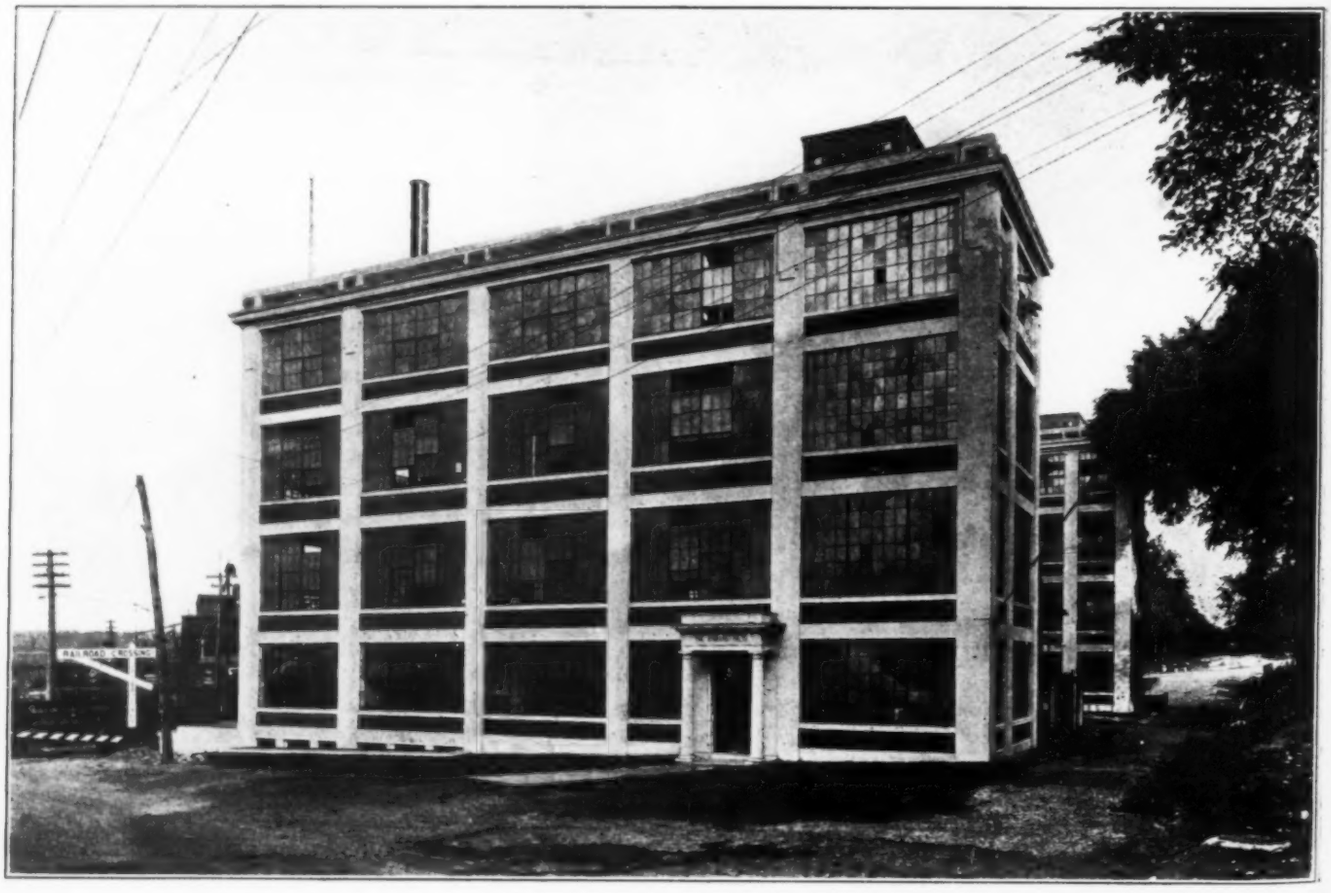
Careful Planning Needed in Building Structures to House Heavy Machinery

By G. W. Maker, Aberthaw Construction Company

VIBRATION in multi-story industrial buildings is a subject of prime importance to the designing engineer, particularly in connection with structures which house processes requiring heavy machinery. Where cheap land is available it is possible to use one story buildings with machine foundations resting directly on the ground, but in congested industrial centers where land is valuable this is not usually practical or economical. In such cases a careful study has to be made of machinery location and layout, as in some types of building a large number of machines placed on the upper floors, and operating at similar speed and in the same line of travel, often causes excessive vibration which not only limits output and qualify but often necessitates a relocation of machinery.

An excellent example of the operation of heavy machinery on an upper floor without appreciable vibration is the recently completed 4-story building for the Rumford Press at Concord, New Hampshire, built by Aberthaw Construction Company of Boston. The structure is of reinforced concrete 80 x 180 ft., designed to house every operation in the production of large editions of magazines and books. It was believed that vibration caused by the operation of the 26 printing presses would be materially lessened if they were not fastened to the floor and accordingly each one was placed on thin wood skids which rest on the granolithic floor without fastening of any sort.

With every press in operation only a slight vibration is felt in the press-room, while on the floors of the building it is not noticeable. It is a good demonstration of what careful planning and construction can do.



Hoist Operates Bucket Plant

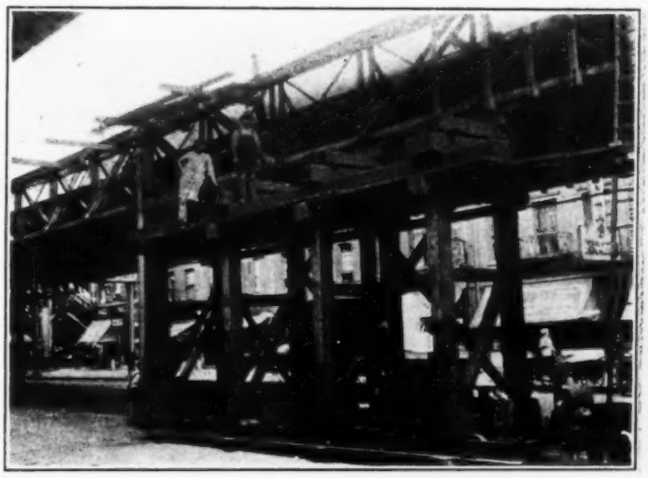
IN the words of the operator the combination which you see in the illustration is able to do anything that a horse or flivver or combination of the two can accomplish. It shows a mast hoist bucket plant with a multiple cylinder gasoline hoist. In the insert the hoist, which is at the base of the mast, may be seen. The photograph was taken on the Livonia Avenue inspection shed inclosure which is now under construction at Linwood Street and Hagerman Avenue, East New York, by the Rosenthal Engineering & Contracting Company.

Although the job is a two-story structure and covers considerable area, the construction of a tower and distributing system was not warranted. Therefore, the portable combination was decided upon. The gasoline hoist is complete with radiator, fan, gasoline tank, magneto, carbureter and all accessories.

Inasmuch as many large cities are discouraging the use of steam hoists and current is not always available for motor-driven equipment, such a type of hoist which is able to stand the continuous and heavy work of a steam or motor-driven hoist would seem to be a boon to large as well as small contractors.

Traveler Speeds "L" Repairs

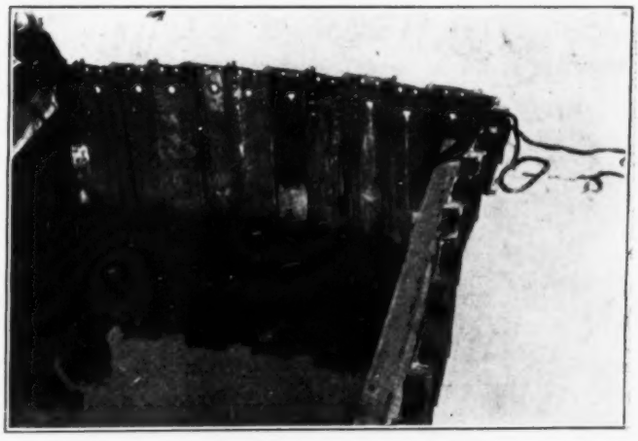
THE Sixth Avenue "L," which by the way is the oldest elevated street railway in the United States, requires considerable attention from the Maintenance of Way Department of the Interborough Rapid Transit Company of New York City. The I-bars must be renewed frequently and the structure reinforced generally from time to time.



To facilitate this work a traveler shown in the illustration which runs on trucks has been in use for some time. The traveler is 32 ft. in length and made of four bents spaced so as to come directly beneath the floor beams. When at work it is jacked off the wheels and blocking placed under the floor beams. Two of these travelers generally work in tandem and remarkable speed is made.

Homemade Steel Sheathing

THIS illustration shows the steel sheathing in use on the job which was fabricated by the contractors a number of years ago when it was next to impossible to obtain steel sheathing of any kind. The sheathing is homemade in design and construction and consists of channels and Z-bars.



Increase Your Output

D. C. Gahan admits he's proud to have his picture taken along with his Type O Thew. He says it's a real shovel and no mistake.

He has loaded as high as 600 one and one-half yard wagons in a single 8 hour day. When you can do that with your shovel you know it isn't going to take long to dig a 6000 yd. basement like this.

Especially when you can load on the bank and at extended radius with no trouble at all and when you have a shovel that makes easy work of rock and root embedded clay.

Notice the perfect balance of the shovel with the loaded dipper up and out.

That's because the 19′ 6″ plate girder shipper shaft boom is standard and the shovel is designed and built for it. Weight exactly balanced; strength where strains are greatest; crowding mechanism that puts more power into the thrust; these are outstanding facts about the Thew boom. And back of it the power and rugged dependability of the shovel.

You can increase YOUR output with the Thew. Write for Bulletin 111.

THE THEW SHOVEL COMPANY, LORAIN, O.

Thew
Power Shovels

THE TURNING POINT

There comes a time on every road job when the contractor begins to see daylight, when the tide of money coming in meets the flood of money going out. Every contractor watches for it, and once past it, begins to enjoy life once more.

The purchase of a CHAMPION AUTOMATIC TURN-TABLE may be the turning point on your job in a double sense. It will cut your costs and speed the job. It occupies only one-half the road, permitting two-way traffic on the subgrade. It turns a truck in 20 seconds. It is fully automatic, requiring no labor as it is operated by the rear drive wheels of trucks.

One road contractor saved $63.60 per day with his CHAMPION, another $21.20, and a haulage contractor saved $33.00.

Only One Size Fits Any Truck

MANUFACTURED UNDER JONES PATENT BY

THE CHAMPION ENGINEERING COMPANY

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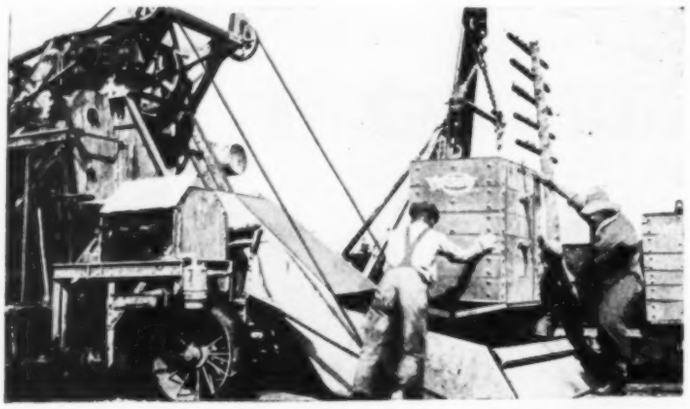


Concrete Road Construction Scenes on the Cannon Ball Trail near Galesburg, Ill.

Western

That's Why

Industrial Haulage, with Western Cars and Batch-Boxes.

They Chose Industrial Haulage

Two partners are handling the concrete road work shown in the pictures. One **operates nine trucks** in another business—knows all about them—their cost—their limitations. The other for 12 years has studied all kinds of road-building methods, as a **Resident Engineer** for the State Highway Department.

They Adopted Western Industrial Haulage (not trucks) for their road job.

Think that over and let it's significance sink in.

"It is a most efficient method of transportation," explained the engineer, "and so simple! Only two small engines to look after instead of the engines in at least eight complicated trucks, with tire trouble on top of that."

Let our road engineers help you to determine the most economical installation and layout for your contract. The mere sale of an outfit does not satisfy us. We want your contract to net you a profit.

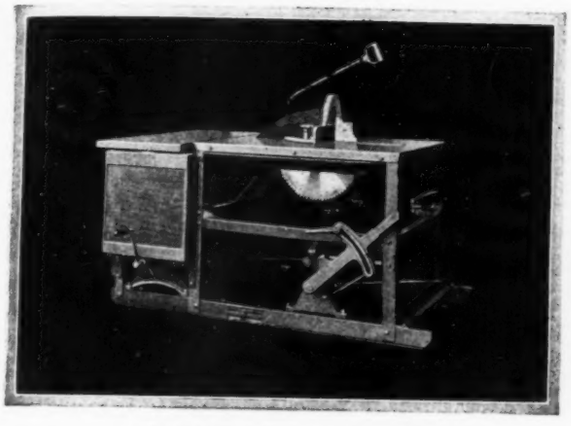
WRITE TODAY.

Western Wheeled Scraper Co.

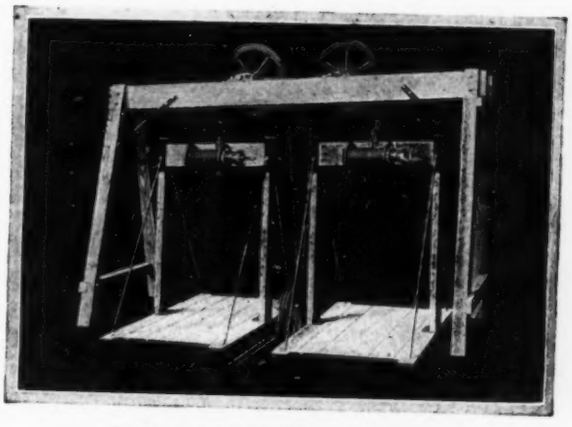
Earth and Stone Handling Equipment

AURORA, ILL.

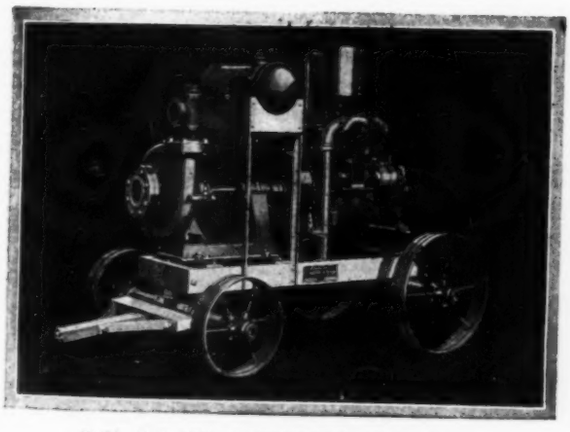
C H & E OUTFITS



C. H. & E. NO. 15 SAW RIG

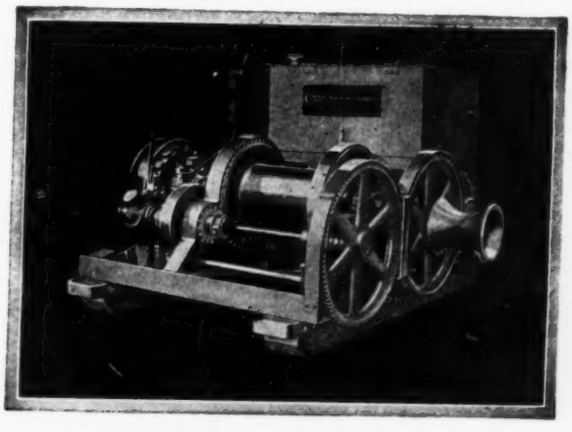


C. H. & E. MATERIAL ELEVATOR

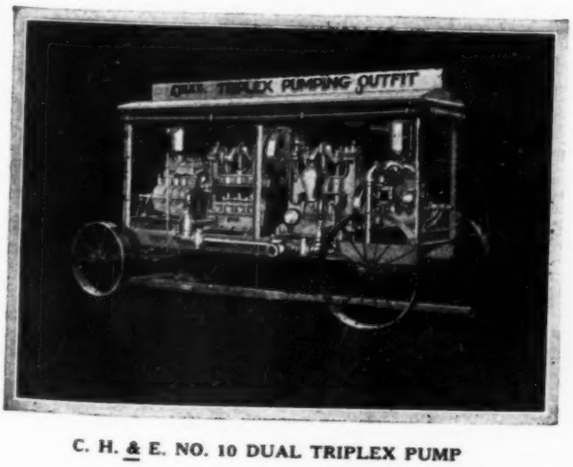


C. H. & E. NO. 10 CENTRIFUGAL PUMP

— Write for Our Catalog —



C. H. & E. NO. 7 REVERSIBLE HOIST



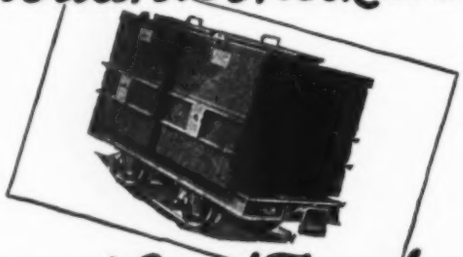
C. H. & E. NO. 10 DUAL TRIPLEX PUMP

C. H. & E. NO. 3 MORTAR MIXER

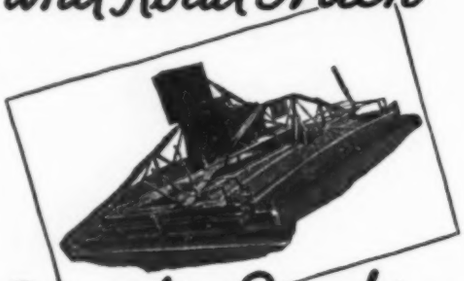
C. H. & E. Manufacturing Co., Inc.

384-A Clinton St. Milwaukee, Wis.

Batch Boxes, Cars

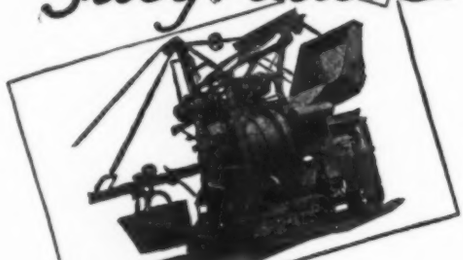


and Road Track



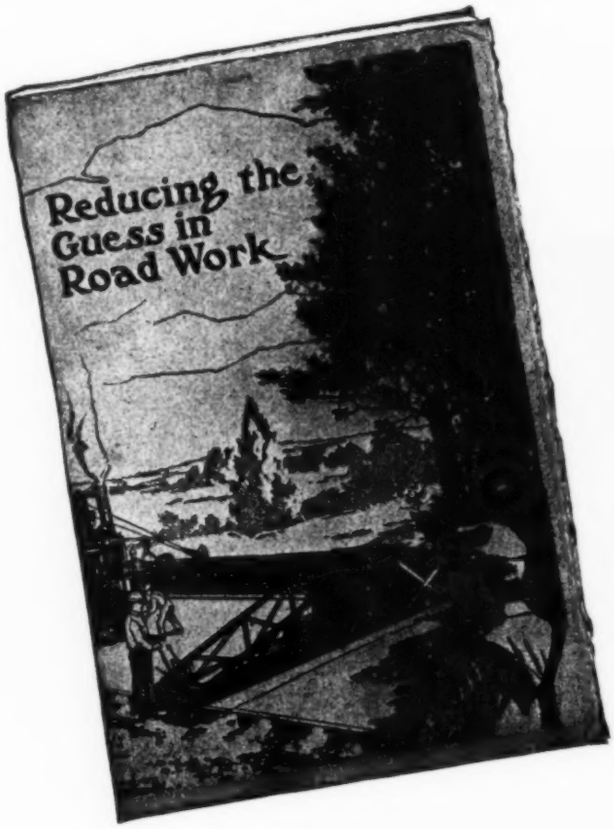
Finishing Machines

Subgraders



Paving Mixers

Clam Shells



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It describes practical methods of handling road construction which minimize "contingencies."

The data on which it is based are the results of the operation of upwards of three hundred road plants, either complete narrow-gauge haul or combination car and truck haul, which The Lakewood Engineering Company has supplied during the past three years.

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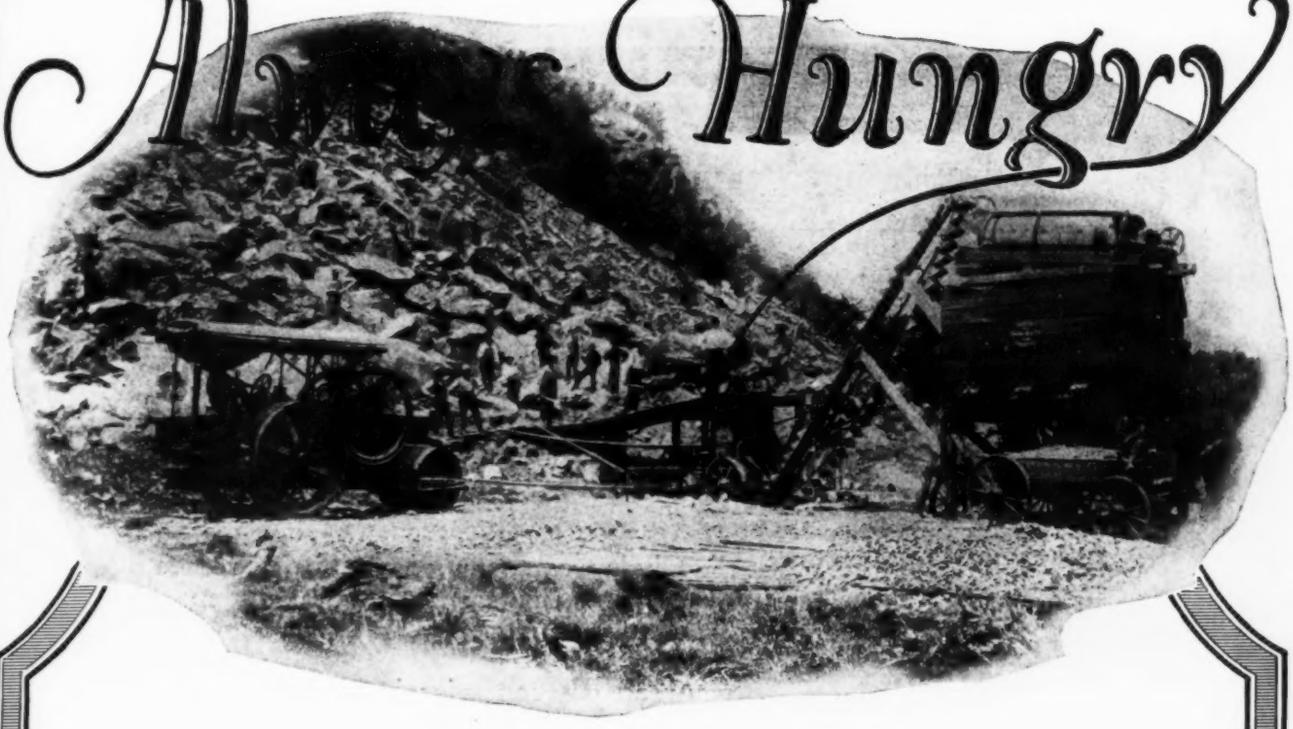

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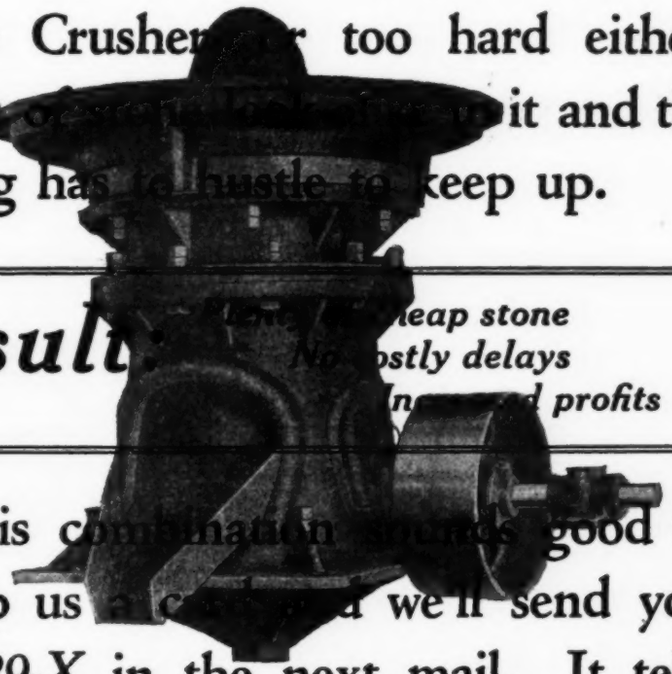
Result: *Low cost per ton for cheap stone*
No costly delays
Increased profits



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IT is not the Clyde way to make indefinite statements concerning the equipment which the company manufactures. Quite the contrary.

When you read of economies in performance and superiority in Clyde manufacture, you are reading statements backed by users of Clyde equipment who write voluntarily of their machines and the results they are producing.

For years the Clyde Company has striven continuously for the ever-better product, Good-enough has never satisfied. This is again illustrated by the improvement in the Silent Chain Drive Gasoline Hoist which is making many new friends for the company and bringing words of praise from the older ones.

Shown here is a 15 H. P. Gasoline Hoist in use by Burt & Tripp, of Herington, Kansas, in connection with a mast hoist bucket outfit.

It recently made a 26 hour continuous run.

THE CLYDE LINE

Steam Hoists *Electric Hoists* *Gasoline Hoists* *Belt Hoists* *Derrick Fittings*
Steel Derricks *Excavators* *Traction Cranes* *Blocks and Sheaves* *Logging Machinery*

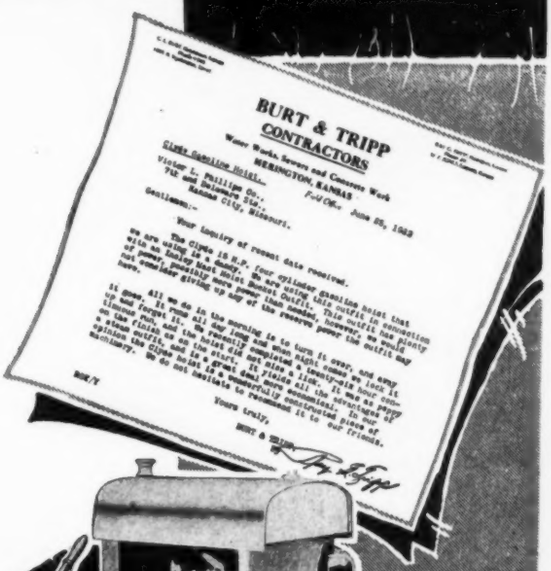
ELIMINATE TROUBLES

"We recently completed a twenty-six hour continuous run, and the hoist did not miss a lick. It was as peppy on the finish as on the start."

That is the statement written by Ray G. Tripp of the firm of Burt & Tripp, contractors of Herington, Kansas, concerning the 15 H. P. Clyde Silent Chain Drive Gasoline Hoist which is handling a big job with no difficulty for Mr. Tripp.

This is one of many voluntary endorsements which are being received by the Clyde Company for this Improved Gasoline unit. The reserve power and economical operation are enthusiastically admitted.

Write for details.


BURT & TRIPP
CONTRACTORS
Water Works, Sewers and Concrete Work
HERINGTON, KANSAS

Victor L. Phillips Co.,
742 Delaware St.,
Kansas City, Missouri.

Gentlemen:-

Your inquiry of recent date received.

The Clyde 15 H.P. four cylinder gasoline hoist that we are using is doing splendid work. We are using this outfit in connection with our Gasoline Mixer. Almost every night we run it continuously from 10 to 12 hours, and on the last run we made it was continuously for 24 hours. We have never had any trouble with it, and we consider it has plenty of reserve power for the outfit we have.

All we do in the morning is to turn it over, and away it goes, it runs all day and when night comes we simply shut it off. We do not have to adjust it or tinker with it in any way. We have a Clyde Gasoline Hoist on the job at Florence, and we have had it there for a year or more, and it has given us no trouble whatever. We have a Clyde Gasoline Hoist on the job at Herington, and we have had it there for a year, and it has given us no trouble whatever

The Day for unmarked wire rope will soon be at end.

More and more superintendents responsible for the safety of their equipment and the lives of their workmen are turning to

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and the protection their Telfax Tape Marker affords.

They realize that the Telfax Tape Marker identification of **each** grade is a protection worthy of their highest endorsement.

Write to us today for conclusive facts about this super-quality product. Ask us for prices. Let us show you now why it is to your best interest to use Williamsport, the wire rope you'll eventually buy.

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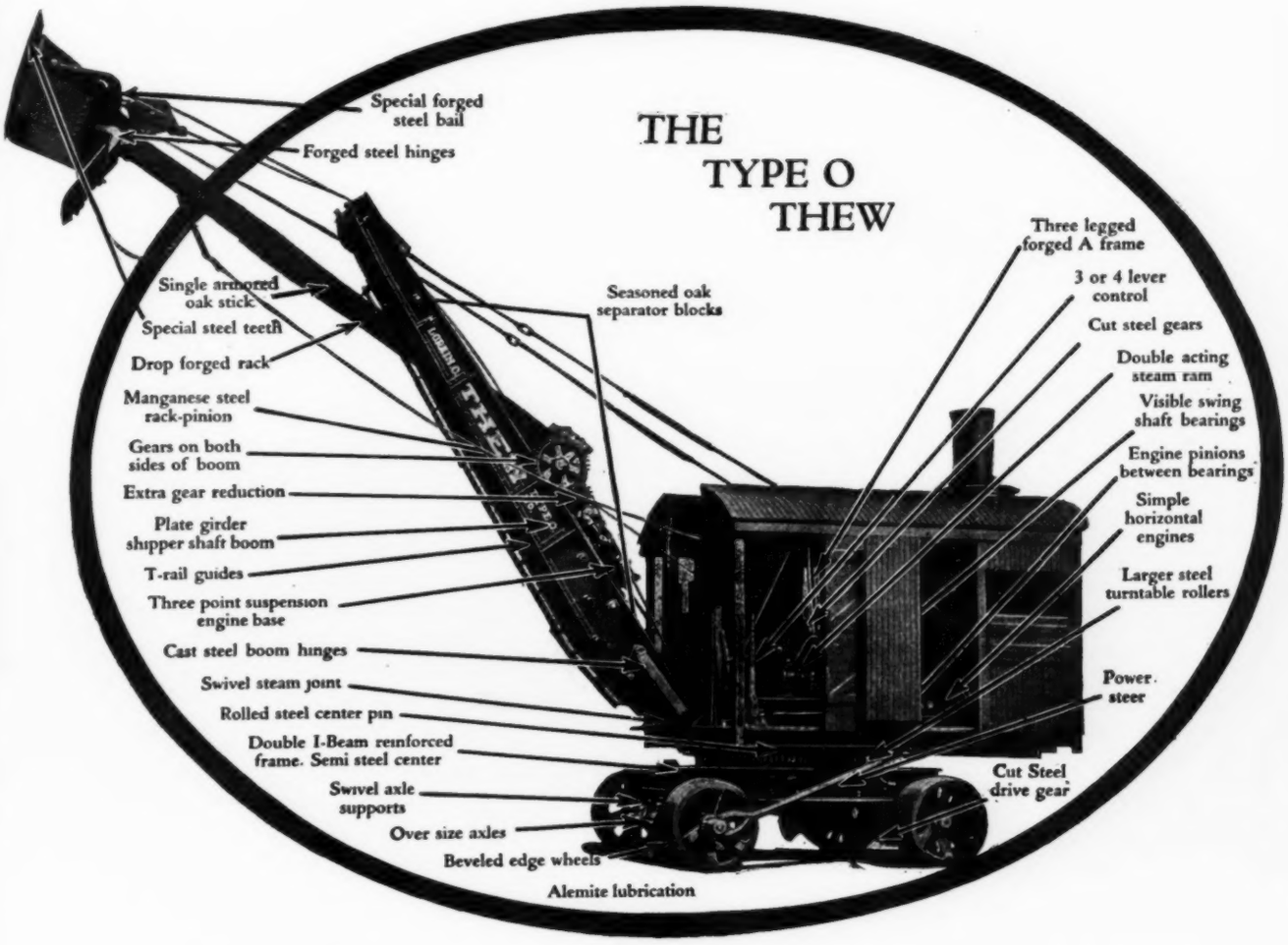
The fastest growing wire rope plant in America

THE STANDARD SHOVEL



Dumps Higher

Even at 20′ the full dipper load goes up and squarely into the truck.

Loads Farther Ahead

Has the power to put the stick out and hold it there for loading trucks on solid ground.

Digs More Dirt

Recognized for consistent output rather than brief record spurts.

Handles Tougher Digging

Frozen earth, packed clay, shale rock or hard pan; the Thew digs them all.

Handles Easier

The Thew operator runs it with 3 or 4 levers as he wishes, and handles record yardage without wearing himself out.

Costs Less to Operate

Less fuel and oil is needed to get more done with the Thew than with the ordinary shovel.

Cheaper to Maintain

A Thew is not a repair shop. It is a shovel built to dig and keep on digging.

Last Longer

Some of them are working yet after more than twenty years.

Has More Experience

Twenty-five years of successful first hand experience in the excavating game is working for each Thew Owner.

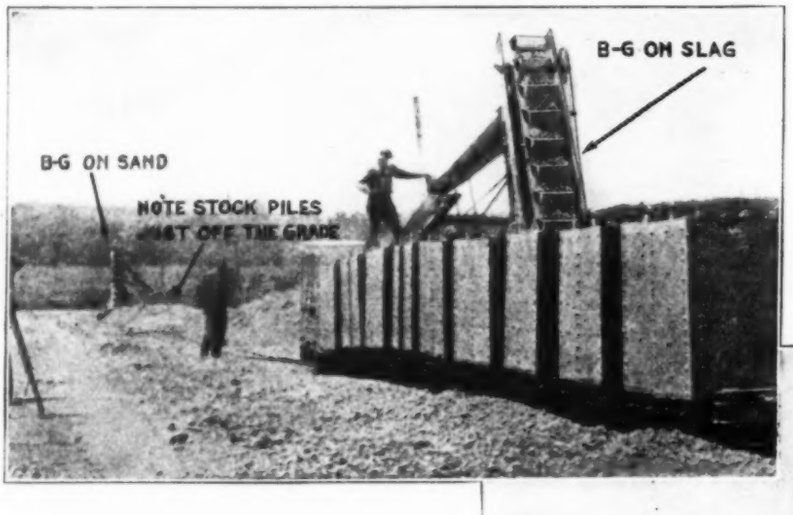
Is Always Up-to-date

All Thews are being constantly and consistently improved.

THE THEW SHOVEL CO., LORAIN, OHIO

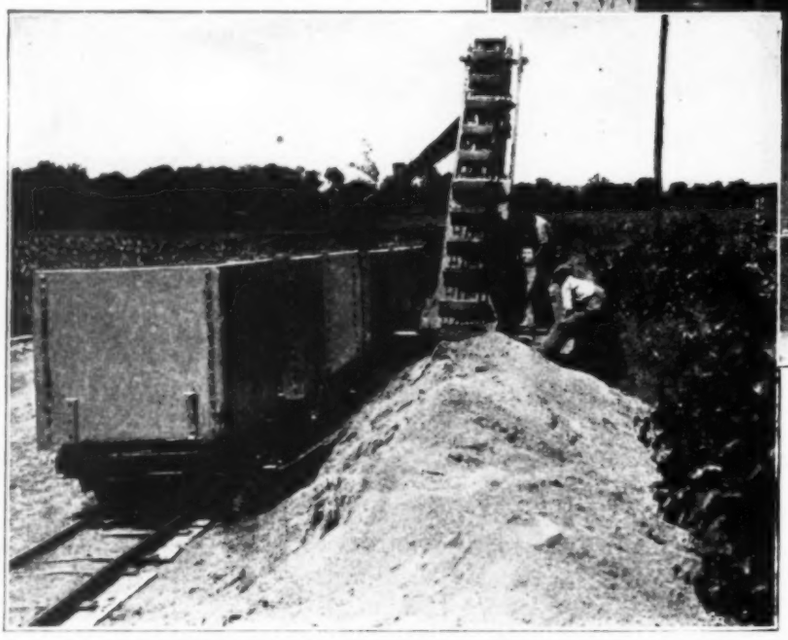
ALMACO EXPORT DEPARTMENT ALLIED MACHINERY COMPANY OF AMERICA ALMACO

Load Industrial Cars



One Barber-Greene on slag and one on sand working from small stock piles beside the grade.

Note the double swiveling spout which gives the loader a wide discharge range particularly good for loading industrial cars.



One helper and sometimes two are needed to aid in digging with the old machine. The new machine does not need any help.

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TWO road jobs in Indiana are examples of a practical way to load industrial cars from small stock piles placed at frequent intervals. They are Kerr & Murphy's job on the National Old Trails near Greencastle, and Shea & Company's job on the Lincoln Highway near Valparaiso. The photographs shown are of the Shea job.

This system gives the contractor the following advantages:

Saves the expense of extra miles of track,

Saves the cost of at least two locomotives,

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Gets the material near the mixer by trucks, thus eliminating the handicaps which heavy grades put upon a long industrial haulage system,

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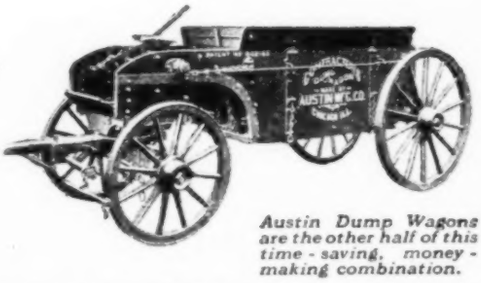

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